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Investigating pathways for agricultural innovation at scale: Case studies from India

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Farmer Producer Organization member and supplier in Safe Harvest's pesticide free value-chain (photo: Safe Harvest).

Commission on Sustainable Agriculture Intensification

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Council on Energy, Environment and Water (CEEW)

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Collectivization of input preparation by Self Help Group members (photo: RySS).

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Acronyms and abbreviations

APCNF	Andhra Pradesh Community-Managed Natural Farming
APMC	Agricultural Produce Market Committee
BLF	Bought Leaf Factory
CRP	Community Resource Person
ETP	Ethical Tea Partnership
FPO	Farmer Producer Organization
FSSAI	Food Safety and Standards Authority of India
HUL	Hindustan Unilever Limited
IDH	Sustainable Trade Initiative
NABARD	National Bank for Agriculture and Rural Development
NF	Natural Farming
NGO	Non-Governmental Organization
NPM	Non-Pesticide Management
PMDS	Pre-Monsoon Dry Sowing
PPC	Plant Protection Code
RySS	Rythu Sadhikara Samstha
SHG	Self Help Group
STG	Small Tea Trower
TBI	Tea Board of India
TCP	Tata Consumer Products
ToC	Theory of Change

Executive summary

CoSAI Innovation Pathways Study: India country study

This is one of three country studies on Innovation Pathways in Agri-food Systems, managed by the Commission for Sustainable Agriculture Intensification (CoSAI).¹ The three studies use a common analytical framework to generate lessons on factors leading to successful innovation pathways, to guide future investment.

Sustainable food systems in India: Challenges and opportunities for innovation

In the Indian agricultural landscape, 92% of innovations for increasing productivity since the Green Revolution have been technology-led innovations (high yielding seeds, chemical fertilizers, etc.) supported by government policies (Singh 2004). However, these technological innovations face the challenge of improving productivity while also accounting for the environment and human development needs. With limited market and policy incentives, the uptake of sustainable agriculture practices and systems thus remains low. Of the 16 practices and systems studied by Gupta et al. (2021), only five were reportedly scaled up beyond 5% of the net sown area and 4% of the farmers in India.

In this context, the Indian food system faces a nexus of challenges in supply, demand and market linkages. At the same time, an increasing number of actors are entering the agriculture space from public, private, non-profit and research institutions (Saravanan and Suchiradipta 2017; Moschitz et al. 2015; World Bank 2012). With the entry of these players come opportunities to innovate and thereby improve environmental, economic and social conditions and outcomes. A sustainable food system will only emerge by replicating and scaling up innovative niches enabled by technical and non-technical innovations. Such innovations may be in the space of technology, finance, business, policy or governance.

Few case studies are available in India on successful innovations that drive sustainability at scale in Indian agricultural systems, and the available ones generally fall short of providing transferrable insights to innovation managers, investors and other stakeholders. This study aims to fill this gap and presents three case studies that drive innovation and impact at scale. This report hopes to provide learnings for India as well as other emerging economies to enable high-impact agricultural innovation pathways, approaches and partnerships. The findings from this study on innovation, strategy to drive innovation, and the factors that have contributed to the success of each of the cases can be used by initiators of innovative programs (public and private), community organizations and investors, as well as academics and researchers.

¹ All of the studies are available on the CoSAI website (<https://wle.cgiar.org/cosai/pathways-for-innovation>).

Characteristics of innovation

The following characteristics of innovation have guided the case study selection and analysis in this report:

- Innovation is an intervention or a bundle of interventions that has created a long-lasting and transformative change.
- The change should be reflected as a positive impact on social, economic and/or environmental dimensions.
- The intervention(s) may be in areas inclusive of, but not limited to, technology, finance, institutional structures, governance, policy and business.
- Innovation is not necessarily a novel idea; it can also refer to an old idea that has been applied in a new way.
- A successful innovation is one that has scaled up significantly in the given context.

Methodology

A list of 20 potential cases was drawn up based on a web search. This was complemented by additional suggestions sourced from organizations working on the topic of sustainable agriculture. Out of this list, three case studies were selected based on eight selection criteria:

Screening criteria

- Sufficient availability of data
- Scale of the program
- Transformational impact in environmental, social or economic aspects of the food system
- Financial sustainability

Case study diversification criteria

- Representing a variety of farms and farmers
- Representing a variety of innovations
- Representing a variety of agricultural contexts and agricultural systems
- Representing a variety of key actors

Data on the three chosen cases were gathered through a review of secondary literature and interviews with key informants who included program leaders, researchers, end-users of the innovation, implementing partners and funders.

Case description

Below is a description of each case outlining the background, the core innovation, the outcomes achieved and the factors that enabled the success of the innovation.

1. **Andhra Pradesh Community Managed Natural Farming (referred to as Andhra Pradesh Natural Farming).** Through the case of Andhra Pradesh Natural Farming we explore distributed innovation. Andhra Pradesh Natural Farming was launched by the Andhra Pradesh government-registered company Rythu Sadhikara Samstha (RySS) in 2016 against the growing need to find alternative farming solutions under changing climatic conditions and increasing economic pressure on farmers in the state of Andhra Pradesh. The key innovation in Andhra Pradesh Natural Farming is a program design that enables distributed innovation, where innovation takes place even outside the leadership of RySS and is distributed among the users of Natural Farming. This means that the

program is designed in such a way that farmers become experimenters and innovators to find solutions suitable to their context. By giving flexibility to farmers to adopt Natural Farming practices at their own pace and customize them to their context, the program facilitates diffusion of innovation and co-evolution of Natural Farming techniques by the farmers and the leaders of Andhra Pradesh Natural Farming. Government support, patient funders and flexibility in program design and funding are some of the main factors that enable sustained experimentation and innovation of Natural Farming solutions, which is vital to Andhra Pradesh Natural Farming.

2. **Safe Harvest Private Limited.** Safe Harvest is a triple bottom line² company retailing “pesticide-free” food in India. It was registered as a for-profit company in 2009 and was the first in India to retail food under the category of “pesticide-free”, differentiating against the organic and conventional food categories. Safe Harvest directly sources produce from Farmer Producer Organizations (FPOs)³ situated across 12 states of India that promote Non-Pesticidal Management agriculture and are aligned with Safe Harvest’s vision to make safe foods available. Over 100,000 farmers organized into these FPO networks, most of whom are small and marginal farmers (including tribal farmers), work with Safe Harvest.

The core innovation at Safe Harvest is the creation of a new product category – “pesticide-free” food – and establishment of the specialized supply chain it requires. Safe Harvest ensures that there are no chemical pesticide residues or adulterants via rigorous testing during the storing, cleaning and value addition processes of consumer food products. The “zero certification” label on their products signals the “pesticide-free” differentiation of their offerings. Currently, Safe Harvest works via a farm-to-kitchen model, making their products available at a comparable price point (maximum 20% higher) to branded conventional food products via big retailers pan-India (both brick-and-mortar stores and popular e-commerce platforms such as Flipkart and Big Basket).

Safe Harvest came out of farmers’ demands for market access and product differentiation, and continues to ensure relevance to this context. It taps into the middle-income consumer market, especially where there is an awareness of and demand for “pesticide-free” foods for health and safety. Safe Harvest’s growth has evidenced that designing to the demands, needs and priorities of key stakeholders, focusing on long-termism and trust-building, is essential.

3. **Trustea.** Through the case of Trustea, we explore innovation in self-regulation by the tea industry. In the early 2000s, public awareness about sustainability challenges of the Indian tea sector had started rising in India and in export markets like the European Union. In response, certain private players such as Hindustan Unilever Limited started stepping up their efforts in driving supply chain sustainability. Self-governance of the industry via supply chain sustainability standards and certifications was considered a high-impact solution. However, global sustainability standards, mainly from the Rainforest Alliance, failed to make much headway in India, especially among the small tea growers (STGs) and bought leaf factories (BLFs). A key reason behind this was that

² Triple bottom line is a business concept wherein firms are committed to measure their social and environmental impact through three Ps: profit, people and planet (<https://online.hbs.edu/blog/post/what-is-the-triple-bottom-line>).

³ FPOs collectivize farmers and thereby increase their access to resources and scope for livelihood generation. FPOs are legal entities composed of primary producers (here, farmers) where profits are shared among members.

Rainforest Alliance's standards were more stringent than the Indian law, specifically regarding labor. With public pressure rising further, it became necessary that an India-specific sustainability standard be tailored and established in the Indian tea industry. Launched in 2013, Trustea is a private sector response to meet this need. It focuses on sustainability issues, such as working conditions of laborers, food safety and other problems prevalent in the Indian tea sector. As of 2020, Trustea has engaged with about 30% of STGs in India and 20% of tea workers and verifies 56% of the total tea produced in India.

Trustea has been able to scale to such levels by innovations in multi-stakeholder engagement and driving compliance among the farmers through capacity building. Trustea is governed and facilitated by a diverse and inclusive multi-stakeholder council with participation and buy-in from tea brands, tea producers (large tea plantations, STGs and BLFs), the Tea Board of India, not-for-profit organizations, civil society, research and academia. Unlike its peers, Trustea does not stop at verification but also invests in capacity building of the STGs, BLFs, tea workers and other tea producers to ensure compliance.

Further, the collaboration of Trustea with private market leaders and the initial support from the Tea Board of India acted as a push and pull for driving Trustea's adoption by producers. The ambitious commitments of market leaders like Hindustan Unilever Limited, Tata Consumer Products and Wagh Bakri, who collectively control more than half of the tea market, to purchase sustainably produced tea created the pull for tea producers to adopt sustainable production. Furthermore, the initial support provided by government bodies like the Tea Board of India at the beginning of the Trustea program stepped up the legitimacy of the Trustea certification and created a push for its adoption.

Findings and conclusion

Listed below are learnings for not only India but also other emerging economies to enable high-impact agricultural innovation pathways.

- 1. End-users need to be placed at the center of innovation via end-user engagement and development of tailored context-specific solutions.**

Recommendation

- Invest in ensuring that the organization and the innovation program is designed to engage end-users throughout the trajectory of innovation, wherein the engagement can take various forms such as consultation, participation in decision making, and co-creation of solutions.

- 2. Trust-building with key stakeholders is essential for long-term sustainability.**

Recommendations

- Invest in instruments that establish trust with all the key stakeholders, such as communication, evidence generation and co-creation.
- Invest in understanding stakeholder motivation and behavior to keep these instruments of trust targeted.

3. Leadership drives the direction and success of the innovation.

Recommendations

- Invest in recruiting/developing the leaders for the innovation programs.
- Avoid relying on innovation models that have succeeded while driven heavily by a uniquely able leadership, because they may have limited replicability or scalability in diverse contexts.

4. Leveraging formal and informal networks/organization in the producer ecosystem can be an efficient as well as effective way to engage with a broader farmer base.

Recommendations

- Public institutions should invest in enhancing formal and informal networks/organizations, such as Self Help Group networks or FPO development, in the farming communities to enable their multiplier effects.
- Include these multiplier effects while assessing the long-term benefits of such investments that focus on nurturing networks/organizations in the producer ecosystem.

5. Government support can come via different channels, such as funding schemes, new regulations and endorsements.

Recommendations

- Explore all the channels to facilitate the government's support to innovation and invest in activating those channels.

6. A strategically crafted but continuously evolving bundle of interventions is essential for long-term success and scale.

Recommendations

- Invest in the capacity of innovators to plan strategically and act responsively while keeping reasonable time horizons in perspective. This capacity includes:
 - the ability to analyze, identify and prioritize the interventions and solutions that need to be bundled right from the beginning, for the success of the core intervention.
 - the ability to learn from the experience and sense material shifts happening inside or outside the organization so that changes required in the bundle can be identified in a timely manner.
 - the agility to tweak or transform the bundle when required and stay responsive to the new findings.
- Invest in Identifying partners who can collaborate for identifying, designing and implementing interventions or solutions beyond the zone of influence of the innovator.

7. Partnerships that are crafted based on the needs of the innovation program, managed rigorously, and evolve with the changing context drive success.

Recommendations

- Encourage synergistic partnerships in innovation investments.
- Invest in supporting instruments (innovation platforms, hubs, etc.) that catalyze partnership discovery.

8. Innovations flourish when a mix of formal and informal actions come together; informal (or unplanned) actions often sow the seeds for formal trajectories of the innovation program.

Recommendation

- Invest in creating space for informal action and interaction, such as networking platforms and innovation hubs.



Collectivized natural farming inputs preparation by Self Help Groups (photo: RySS).

1. Introduction

This is one of three country studies on Innovation Pathways in Agri-food Systems, managed by the Commission for Sustainable Agriculture Intensification (CoSAI).⁴ The three studies use a common analytical framework to generate lessons on factors leading to successful innovation pathways, to guide future investment.

In the Indian agricultural landscape, 92% of innovations for increasing productivity since the Green Revolution have been technology-led innovations (high yielding seeds, chemical fertilizers, etc.) supported by government policies (Singh 2004). Currently, however, technological innovations face the challenge of delivering packages that improve productivity while accounting for the environment and developmental needs (Singh 2004). At the same time, there is meager investment and technical support by the public and private sectors for alternative agricultural practices. In 2021, the budget allocated to the National Mission for Sustainable Agriculture (NMSA) – the flagship program on sustainable agriculture – is just 0.8% of the INR 142,000 crore (USD 19.2 billion⁵) budget of the Ministry of Agriculture and Farmers' Welfare (Gupta et al. 2021). Furthermore, the Green Revolution-based regime has historically focused on irrigated regions, limiting investment and innovation in rainfed regions (60% of India's cultivated land).

A system that supports shifts in farmers' behavior is fundamental to scaling any agricultural innovation. Findings from the report *Sustainable agriculture in India 2021* (Gupta et al. 2021) show that there is a dearth of transitional support to farmers as they shift from conventional practices to low-input sustainable practices (supporting the initial income loss, capacity development, etc.). At the same time, there are limited incentives from the market (e.g. significant price premiums) and limited availability of implements for weeding or residue management to reduce the labor cost of alternative agricultural practices such as intercropping or Natural Farming. To top it all, the existing incentive structure discourages the transition to sustainable agriculture. For instance, the government has budgeted INR 71,309 crore (USD 9.7 billion, equivalent to half the budget of the Ministry of Agriculture and Farmers' Welfare) to subsidize the use of chemical fertilizers in fiscal year 2021-22. All of the above has led to the prevalence of practices (such as indiscriminate use of pesticides) that do not necessarily improve productivity, and have severe repercussions on profitability, the environment and human health (Shetty et al. 2014; Bhardwaj and Sharma 2013; Sharma and Singhvi 2017). The uptake of sustainable agriculture practices and systems thus remains low. Of the 16 practices and systems studied by Gupta et al. (2021), only five were reportedly scaled up beyond 5% of the net sown area and 4% of the farmers in India. The challenge of transitioning to sustainable agriculture is compounded by the challenge of increasing frequency of natural disasters and extreme climate events such as acute droughts and floods, which negatively impact agricultural production and growth in India (Gupta et al. 2021).

The opportunities for innovation in the Indian agricultural system lie in the nexus of these challenges. With a hike in the number of actors in the agriculture space from public, private, non-profit and

⁴ All of the studies are available on the CoSAI website (<https://wle.cgiar.org/cosai/pathways-for-innovation>).

⁵ Approximate exchange rate: USD 1 = INR 73.81 in 2021.

research institutions, there are increasing opportunities to broker innovation networks (Saravanan and Suchiradipta 2017; Moschitz et al. 2015; World Bank 2012). There is large scope for innovations in sustainable agriculture through refocusing investments and building new inter-ministerial and public–private collaborations.

Few case studies are available on successful innovations that drive sustainability at scale in Indian agricultural systems. The available ones generally fall short of providing transferrable insights to innovation managers, investors and other stakeholders for actively catalyzing large-scale innovation. Bringing out detailed case studies on successful innovations in India’s agricultural systems can potentially provide learnings for not only India but other emerging economies to enable high-impact agricultural innovation pathways, approaches and partnerships.

Therefore, this study presents case studies on three different innovations at scale, driving sustainability in agriculture in very different contexts.



Whole mung green cleaning (photo: Safe Harvest).

2. Methodology

This study adopted an investigative approach to pathways of innovation in SAI, using a common analytical framework developed by CoSAI in the form of guiding questions (Annex 1). This approach was applied across all three case studies covering Brazil, India and Kenya.

2.1 Case selection

A list of potential cases was created based on web searches, and this was complemented by additional suggestions sourced from partner organizations of the Council on Energy, Environment and Water (CEEW) working on the topic of sustainable agriculture. We have considered the following characteristics of innovation while identifying these cases:

- An innovation is an intervention or a bundle of interventions that have created a **long-lasting, measurable and transformative change**.
- The change should be reflected as a **positive impact on social, economic and/or environmental dimensions**.
- The intervention(s) may be in areas inclusive of, but not limited to, technology, finance, institutional structures, governance, policy and business.
- Innovation is not necessarily a novel idea; it can also refer to an **old idea that has been applied in a new way**.
- A successful innovation is the one that has **scaled up significantly** in the given context.

This master list of sourced case suggestions was screened based on selection criteria explained in Annex 2.

2.2 Case study

The objective of the case study process was to capture the key takeaways (practical, evidence-based lessons on factors that influence success in pathways for innovation for sustainable agriculture intensification) from each of the cases that have created transformative and sustainable change, at scale. In other words, the research aims to understand the contribution of factors such as the innovation process and strategy adopted by the case, characteristics of innovation, the role of enabling environment, and timed intervention by stakeholders toward making innovation successful. The overall analytical approach was based on developing and analyzing a modified version of the theory of change (ToC) for each case.

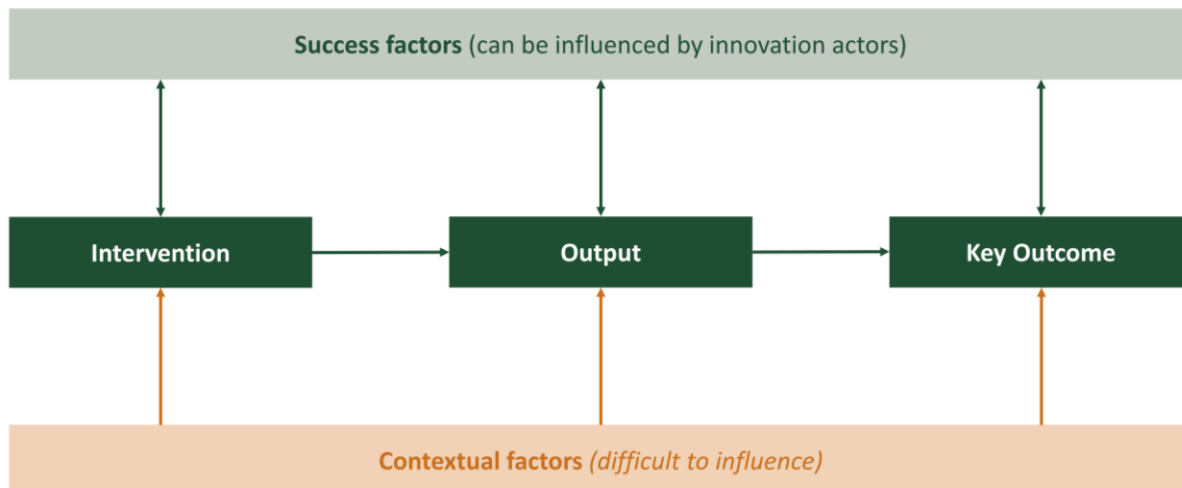


Figure 1. A modified version of the results chain.

Source: Authors' analysis.

To build and analyze the ToCs, relevant literature on the selected cases and detailed interviews with key informants (from multiple stakeholders to enable triangulation; Annex 3) were used. Literature consists of documents available from the case website as well as independent research papers, if available. The primary informants were identified on the basis of available literature on selected case studies. A snowball sampling method was used to identify the following key informants.

Beyond the above-described modified ToC framework, each case has been analyzed using a set of questions that can be found in Annex 1. These questions were common across the three country case studies.

2.3 Limitations of the analysis

Where possible, CEEW has sought and assessed the evidence of proper implementation of key activities, changes affected at different levels of the ToC, and contribution of contextual/external factors in driving change along with ToC chains. However, the case analyses have the following limitations:

- Due to the pandemic, the team was not able to conduct ground visitations. All interviews were held online or over the telephone. Multiple calls were conducted with individual stakeholders to compensate for the lack of physical interaction.
- Given the snowball sampling method adopted to conduct the key informant interviews, interviewees were largely limited to contacts shared by the key stakeholders or drivers of the programs studied. To mitigate this limitation, independent researchers have been identified to peer review all the case analyses.

3. Case studies

3.1 Andhra Pradesh Community Managed Natural Farming



Mulching for soil moisture retention (*photo: RySS*).

3.1.1 Background

Andhra Pradesh Community Managed Natural Farming (referred to as Andhra Pradesh Natural Farming in the following sections) was commenced in 2016 by the Andhra Pradesh government-registered company Rythu Sadhikara Samstha (RySS) – Farmers’ Empowerment Association in English. RySS is a not-for-profit company that aims to promote Natural Farming (NF) and support agricultural extension activities in Andhra Pradesh. As the implementing agency of Andhra Pradesh Natural Farming, it can independently receive support from international organizations such as the United Nations as well as funders including private foundations (Saldanha 2018). However, it is not completely autonomous from the state government: The Chief Minister of Andhra Pradesh is the Chairperson of RySS.

Andhra Pradesh Natural Farming (formerly known as Climate Resilient Zero-Budget Natural Farming⁶) is an offshoot of its antecedent, Community Managed Sustainable Agriculture. Community Managed Sustainable Agriculture was initiated by the Society for Elimination of Rural Poverty and Government of Andhra Pradesh in 2004 under the leadership of T. Vijay Kumar (Veluguri et al. 2021). The program aimed to promote non-chemical pest management in the state to overcome the challenges of high pesticide consumption and financial pressure on small farmers in the early 2000s. At that time, Andhra Pradesh was recorded as the highest pesticide-consuming state in India (Bharucha et al. 2020: 7). Small farmers spent as much as 35% of their cultivation expenditure on synthetic fertilizers, and 82% of the farmers were indebted, with loans twice as high as the national average (Bharucha et al. 2020: 7).

The continued need for alternative farming solutions under changing climatic conditions and increasing economic pressure on the farmers set the context for Andhra Pradesh Natural Farming (RySS 2019a). The program objective is to revamp the food systems landscape by decreasing input costs for farmers, rejuvenating soil and plant health, and increasing access to nutritious food for all (G.M. Muralidhar, Senior Consultant, RySS, August 12, 2021). In 2016, Andhra Pradesh Natural Farming started with a set of farming principles and practices of Zero-Budget Natural Farming that aimed to enhance soil fertility without using fertilizers and by using only locally available resources (Tripathi et al. 2018). These principles were developed by Subhash Palekar, a farmer leader from the state of Karnataka. Following up on his former efforts in Community Managed Sustainable Agriculture, T. Vijay Kumar, the current Co-Vice Chairman of RySS and the former Special Chief Secretary of Agriculture, has also played a key role in the adoption and implementation of Andhra Pradesh Natural Farming. Inspired by the success of the Natural Farming movement in Karnataka, he leveraged his network and brought together government officials in Andhra Pradesh to build consensus over the adoption of NF (Veluguri et al. 2021) in Andhra Pradesh. This led to the development of RySS that in its current form is the implementing body of NF in the state. As the program is scaling up, the leadership is enriching the learnings about NF.

Non-governmental organizations (NGOs) working in the field around Andhra Pradesh are one of the main sources of knowledge on alternative solutions for RySS. In its current evolved form, Andhra Pradesh Natural Farming follows a set of 13 agroecological principles which are inclusive of traditional farming knowledge and chemical-free practices such as permaculture regenerative agriculture, conservation agriculture, silvopasture, tree intercropping, multi-strata agroforestry and farmland

⁶ The program changed its name from Climate Resilient Zero-Budget Natural Farming to Andhra Pradesh Community Managed Natural Farming in 2019 to mitigate the implications of “zero budget” in NF practices.

restoration (ICRAF and RySS 2020). The program exists in approximately 3,700 Gram Panchayats⁷ covering approximately 750,000 farmers and farmworkers who have either completely or partially adopted NF, making it “one of the largest agricultural and food systems transformations on the planet” (Rosenstock et al. 2020). It plans to bring 8 million acres of farmland under NF and shift all the 8 million farmers and farmworkers to NF practices by 2027 (Swati Renduchintala, Project Executive, Andhra Pradesh Natural Farming). The Andhra Pradesh Natural Farming program envisions full saturation of the state with NF. At present, it is observed that adoption of NF is higher among smallholder and subsistence farmers. Some large commercial farmers who see a high market value of NF produce have also adopted the practice (Chandrasekhar Chakrala, Thematic Lead Farmers Institution, RySS, August 24 and 31, 2021).

The Andhra Pradesh Natural Farming pilot was launched in 2016 in 615 Gram Panchayats (715 villages) out of a total of 13,000 Gram Panchayats in Andhra Pradesh. These were villages where Andhra Pradesh Natural Farming’s precursor program, Community Managed Sustainable Agriculture, had already been implemented in 2004 (Kumar 2018: 5). Out of the 40,000 farmers who enrolled in the Andhra Pradesh Natural Farming pilot, most were already practitioners of non-chemical farming. These farmers were inducted as master farmers (or champion farmers) under Andhra Pradesh Natural Farming, some of whom took on the role of Community Resource Persons (CRPs).

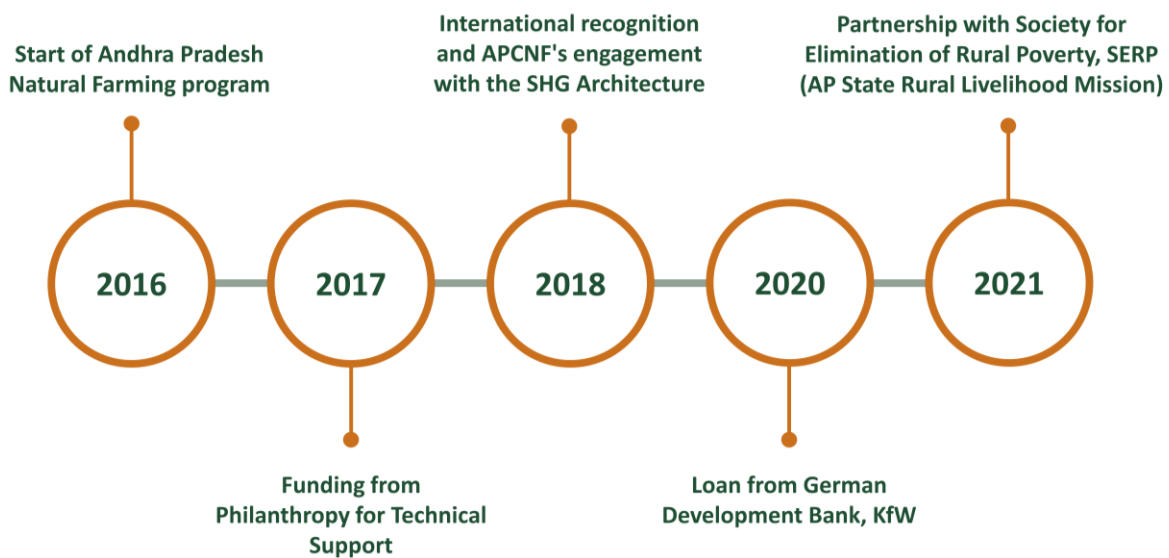


Figure 2. Timeline of key events at Andhra Pradesh Natural Farming.

Source: Authors’ representation based on inputs from interviews.

Andhra Pradesh Natural Farming program’s strategy of scaling up and diffusing innovation comprises the use of CRPs and women-led Self Help Groups (SHGs)⁸. Salaried CRPs are responsible for reaching out and training other farmers in NF. They are also practitioners of NF and are constantly available to

⁷ Gram Panchayats are the formal and democratic federal governance structures at the village level in India. One Gram Panchayat may consist of one or more villages.

⁸ SHGs are small groups of economically vulnerable members (about 10-20 ideally). The purpose of forming an SHG is to promote savings and thrift among members, facilitate internal lending and discuss social and economic issues that directly impact them. SHGs are identified as primary agents of intervention for developmental activities under the National Rural Livelihood Mission of India.

mentor the farmers and cater to doubts either through demonstrations or on the farmers' plot itself. CRPs are also responsible for facilitating community monitoring and evaluation of NF practices in the field. They act as the eyes and ears of RySS. The CRP cadre is divided into junior CRPs (also known as iCRPs) and senior CRPs. The junior CRPs report to senior CRPs who are cluster-level managers of Andhra Pradesh Natural Farming and keep track of all progress, challenges and wins of the community members at the cluster level (one cluster consists of five Gram Panchayats). They act as the bridge between the program and the community. Another cadre of Andhra Pradesh Natural Farming responsible for technical knowledge dissemination are the Natural Farming Associates⁹ who are agricultural graduates who practice NF on their plots. Their plots are used as demonstration plots for other farmers.

SHGs play an important role in scaling up as well as providing finance to small farmers through cumulative savings to enable the transition to NF. Initially, the program engaged with male farmer groups that had been formed during the Community Managed Sustainable Agriculture program by the Society for Elimination of Rural Poverty. By 2018, they realized that there was not enough discipline or cohesion among these groups, which inhibited the adoption and scaling of the program. An internal impact study in 2020 showed that in districts where Andhra Pradesh Natural Farming had partnered with SHGs between 2018 and 2020, the adoption of the program was 80-90% more than that in other districts (Chandrasekhar Chakrala, Thematic Lead Farmers Institution, RySS, August 24 and 31, 2021). RySS changed its strategy and involved the women's SHGs who had already engaged in several developmental programs and showcased success. In addition to employing the existing social capital comprising champion farmers and SHGs, RySS created new champion farmers and more SHGs who played an important role in scaling the program. SHG members are interested in NF as they are able to experiment with the solutions at their household level and create opportunities for their family members and village youth by setting up Non-Pesticide Management (NPM) shops. These NPM shops sell all the NF inputs such as Jeevamritha and Beejamritha¹⁰ as well as containers required to store natural inputs. This has a two-pronged impact in the villages: (1) employment generation among youth in the villages; and (2) less dependency of the farmers on RySS to provide inputs. In terms of financing the farmers, SHGs lend money to the group members as well as other farmers to be able to buy inputs for NF such as storage containers and local seeds. For those farmers who may not be able to buy these resources, SHGs have also implemented collectivization of natural inputs in some parts of Andhra Pradesh where all community members contribute what they can (for example, cow dung, cow urine, containers and jaggery) to collectively make and share the natural inputs. This is noticed in Vijayanagar district of the state where only 1-2 families have cows (Chandrasekhar Chakrala, Thematic Lead Farmers Institution, RySS, August 24 and 31, 2021).

Apart from the community cadre, Andhra Pradesh Natural Farming deputed extension officers of the agriculture department of Andhra Pradesh as program managers at district levels. A description of the flow of information within Andhra Pradesh Natural Farming is given in Figure 3.

⁹ Formerly known as Natural Farming Fellows.

¹⁰ Methods and materials for preparation of Jeevamritha and Beejamritha, and further information of their impact, can be found here: [https://orgprints.org/id/eprint/23621/1/23621%20N.Devakumar_OWC\)research%20track%202014%20microbial-1_MM.pdf](https://orgprints.org/id/eprint/23621/1/23621%20N.Devakumar_OWC)research%20track%202014%20microbial-1_MM.pdf).

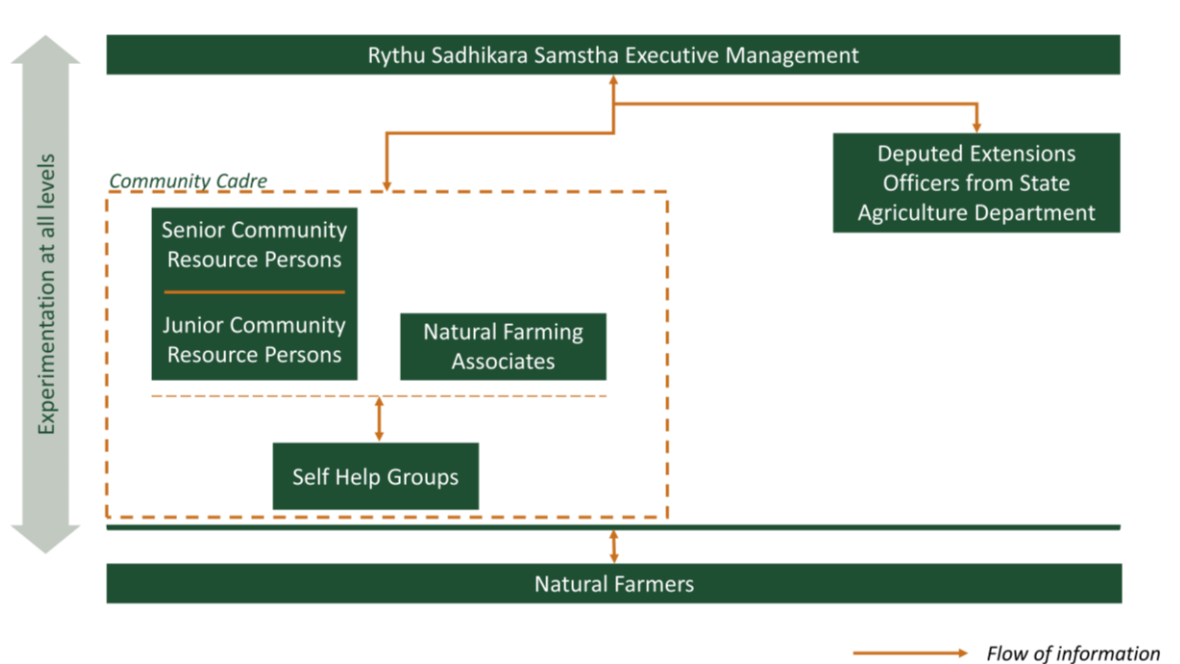


Figure 3. The flow of information between RySS leadership and the community cadre.

Source: Authors’ representation based on inputs from interviews.

The program budget was initially estimated at INR 2,479 crore (USD 3.3 billion). In 2017, the Andhra Pradesh government partnered with Sustainable India Finance Facility – a partnership between the United Nations Environment Program, BNP Paribas and the World Agroforestry Centre that aims to ‘leverage private finance for the public good’. The partnership aimed to facilitate investments toward scaling up NF in Andhra Pradesh (UNEP 2018).

The programmatic costs are covered through two national schemes of India for agriculture and farmers’ welfare. RySS is constantly working toward convergence of existing government schemes to avail funding for Andhra Pradesh Natural Farming. Recently, the Society for Elimination of Rural Poverty, the Department of Rural Development of the Government of Andhra Pradesh has also agreed to support Andhra Pradesh Natural Farming. Apart from this, the Government of Andhra Pradesh has received a performance-based loan from the German Development Bank, KfW, worth EUR 90 million to be released over a period of five years in support of Andhra Pradesh Natural Farming for approximately 720 Gram Panchayats. The government believes that as NF scales up, the state will be able to save on expenditures on electricity and water subsidies provided to farmers. These savings will enable the repayment of the loans to KfW. The performance-based loan will be released upon completion of certain targets based on three indicators: (1) the number of CRPs identified, trained and deployed; (2) the number of farmers enrolled and hand-held in NF; and (3) the number of farmers entirely transitioned (vertically and horizontally)¹¹ to NF. The remainder of the funding of approximately INR 750 crore (USD 108 million) is expected to be met through the central schemes of India (RySS 2019b). Before this recent inflow of funds, one of the key supporters in the initial phases

¹¹ “A vertical transition phase will include shifting from a few natural practices to using all-natural inputs and complete elimination of synthetic fertilizers and pesticides. Until then, they are referred to as chemical partial farmers. A horizontal transition happens when the complete landholding of a farmer is brought under natural farming.” (Gupta et al. 2020: xiv).

was the Azim Premji Foundation. In 2017, the program had received INR 100 crore (USD 13 million) from this philanthropic organization for the technical implementation of the program, to accomplish a shared vision of scaling up NF in Andhra Pradesh. T. Vijay Kumar had played a fundamental role in attracting such financial support through a network of facilitators.

3.1.2 Innovation in Andhra Pradesh Natural Farming

The key innovation in Andhra Pradesh Natural Farming is the program design that enables distributed innovation.

Distributed Innovation in Andhra Pradesh by Andhra Pradesh Natural Farming. Distributed innovation is defined as “innovation that no longer takes place within a single organization, but rather is distributed across multiple stakeholders in a value network” (Bogers and West 2012). In Andhra Pradesh Natural Farming, innovation takes place even outside the leadership of RySS and is distributed among the users of NF. This means that the program is designed in such a way that farmers become experimenters and innovators to find solutions suitable to their context. RySS has created an enabling environment such that innovation can organically emerge among the farmers. By giving flexibility to the farmers to adopt the NF practices at their own pace and customize them to their context, the program facilitates diffusion of innovation and co-evolution of NF techniques by the farmers and the leaders of Andhra Pradesh Natural Farming.

Following are examples of how distributed innovation emerges in Andhra Pradesh Natural Farming:

The emergence of Pre-Monsoon Dry Sowing (PMDS) is one of the key examples of successful distributed innovation in Andhra Pradesh Natural Farming. The principles of PMDS are based on the theory of NF but the technique had never been tested or scientifically validated on the ground. PMDS is a combination of pre-monsoon sowing and dry sowing, as the name suggests. Pre-monsoon sowing means sowing before the monsoon to effectively utilize the moisture available in the atmosphere and to make the crops resilient to droughts using NF principles (dry mulch, wet mulch, live mulch, seed treatment and intercropping). Dry sowing means sowing during dry periods, throughout the year, regardless of the regular monsoon season. This helps to maintain year-round green cover in all districts. The combination of these techniques with the usage of ‘Navdhanya’ seeds (a combination of nine cereals and millets), mulching and seed treatment provides moisture to the soil. This facilitates microbial activity which regulates the moisture in the root zone of the crop (Mr Naik, District Programme Manager, Ananthapuramu).

Thus, PMDS overcomes dependencies on rainfall for crop germination. Only 5-10 mm rainfall is sufficient in PMDS up to the reproductive stage of the crop, and 10-15 mm rainfall for germination. For conventional practices, rainfall requirements are as high as 24 mm (Mr Naik, District Programme Manager, Ananthapuramu). As the sowing of crops is not completely dependent on rainfall, PMDS breaks the cycle of two agricultural seasons and creates three seasonal cycles with a diversity of crops. PMDS practices vary from district to district based on their context. For example, in drought-prone regions dry mulching is always done for moisture retention, which may not be the case in other regions with high water availability.

In order to push innovation in Andhra Pradesh Natural Farming, the PMDS theory was communicated to 12 Natural Farming Associates. The Associates experimented with the PMDS theory on the ground using a combination of scientific and traditional knowledge combined with locally available resources.



Peer learning sessions for Natural Farming interventions (photo: RySS).

They experimented with sowing periods, input quantities, kinds of inputs, etc. to discover the optimum technique of PMDS in Andhra Pradesh. One of these 12 Natural Farming Associates was successful in their experiment, and thus emerged PMDS. Farmers across Andhra Pradesh are being informed about PMDS. As they apply the techniques to their farm, they experiment further by finding their own crop combinations and tweaking quantities of natural inputs applied in PMDS. Currently, more than 300,000 farmers are practicing PMDS in Andhra Pradesh.

Apart from the innovation of PMDS, farmers experiment with different concepts on the ground. The Annapoorna farming model¹² and 5-layer model of NF¹³ are examples of such experimentations.¹⁴ Though not new in concept, these practices have been initiated by the farmers to promote healthy crop production and nutritious food. Farmers have adopted and modified these models according to their needs (Bharucha et al. 2020: 14; Kumar et al. 2019: 2). Farmers always experiment first on a small piece of land. They compare the results of the new techniques of NF and conventional farming on the rest of the farm before scaling up NF to their entire farm. This allows them to verify the benefits of NF practices themselves, to scale up NF activities entirely.

¹² Annapoorna is a system of crop cultivation on half-acre plots further divided into smaller pieces of land where farmers try out different cropping patterns. This technique enables the poorest of the poor farmers to cultivate crops in different ways. It uses a combination of trenches, raised beds and mulching to optimize microbial activity in the soil.

¹³ This model is a multi-tier intensive cropping model that integrates trees with various levels of plant canopies. Each layer provides an optimum level of the sunlight for the crops. It includes various crop and tree combinations, including living fences on the edges, and trenches for water harvesting (<http://www.mchrddi.gov.in/94fc/week4/shilpa/ZBNF%20-%20COP14%20-%2013Sept2019-1.pdf>) (<https://agriallis.com/wp-content/uploads/2019/11/ZERO-BUDGET-NATURAL-FARMING-ZBNF-SECURING-SMALLHOLDER-FARMING-FROM-DISTRESS.pdf>).

¹⁴ The evidence on this information is only through secondary research. The study lacks primary proof and evidence of experimentation and modification of NF techniques by farmers.

The program ensures that farmers can use NF knowledge as a tool to innovate on the ground. The farmer-to-farmer extension model augments the innovative spirit of farmers. As farmers see their neighbors benefit from NF, they are more willing to adopt NF techniques and experiment on their own land. Videos of champion farmers in local languages are also showcased to the farmers to trigger familiarity and facilitate knowledge absorption.

By allowing experimentation at various fronts, Andhra Pradesh Natural Farming gains a diverse perspective on the practical realities of sustainable farming techniques on the ground. As a few farmers start experimenting, it augments the spirit of others to adopt and customize NF techniques.

3.1.3 Outcomes and impacts

Economic

Low-cost technique. Farmers practicing NF incur a very low cost of inputs, as the practice uses resources available in the farmers' land or surroundings (Hemasundar, Natural Farmer, August 26, 2021). At the same time, NF techniques entail the usage of local varieties of seeds and do not require tillage (Vankadoth Lakshmanaik, District Project Manager, RySS, August 20, 2021). The cost of cultivation of NF is lower compared to conventional farming practices (Bharucha et al. 2020; Galab et al. 2019). A study by Gupta et al. (2020: xvi) shows that, on average, conventional farmers cultivating rice spend INR 5,961 (USD 79) per acre on chemical inputs, while a completely NF farmer spends INR 846 (USD 11) on natural inputs. It should be noted that NF inputs require the use of cow dung. Cattle are an expensive resource for small farmers, so scaling up NF with such input requirements is an ongoing challenge for the program. Moreover, further studies are required that account for labor requirements and associated costs in NF.

Increased income. Studies show an increased annual revenue for natural farmers compared to conventional farmers. Nizamiah Observatory Campus observes that natural farmers get a 47.6% higher net income per hectare on paddy rice and 79% on bananas in the Rabi season compared to non-natural farmers (Galab et al. 2019: 5). This difference is the highest in Bengal gram, with 133% higher net income for natural farmers (ibid). RySS observes that under PMDS, groundnut farmers reportedly earned INR 106,900 (USD 1,443) in the year 2019-20, whereas conventional farming yielded earnings of INR 43,300 (USD 584) in the same year (Kumar 2021). Also, intercropping and PMDS provided INR 66,431 (USD 900) from 0.4 ha (1 acre) of land as additional income in a year to the farmer (Kumar 2021). In tribal areas, an income rise of 20% has been observed (ibid).

In the case of PMDS, the illustrations show an increase in the number of crop cycles as well as greater crop diversity. This combined reduced cost of cultivation and premium price received for produce, farmers would earn higher incomes for their produce. Below, Figure 4 shows the conventional scenario of monoculture in the tribal area of Paderu. Figure 5 shows the increase in crop production, diversity and sources of farmers' income with the application of PMDS techniques. Annual net income in the Paderu trial area of Andhra Pradesh has increased from INR 38,500 (USD 513) to INR 86,600 (USD 1,155) per annum with the incorporation of PMDS¹⁵ (Kumar 2021).

¹⁵ These numbers are not from independent research. Further research must be done to understand the impact of PMDS on cost of production for natural farmers.

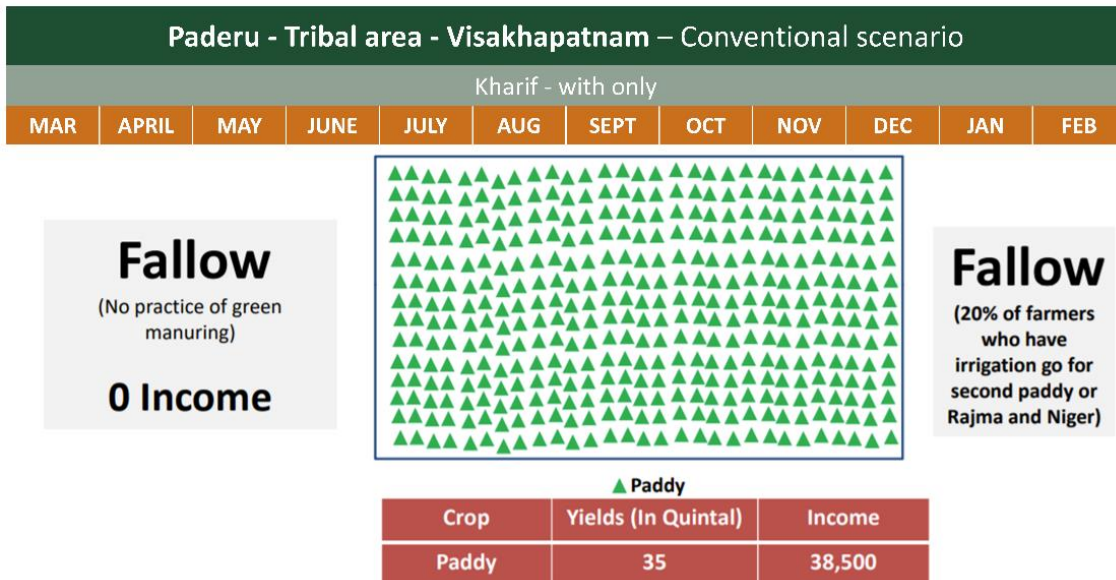


Figure 4. The conventional scenario of monoculture in the tribal area of Paderu.

Source: Andhra Pradesh Community Managed Natural Farming: A System-wide Agroecology Transformation for people and planet. T. Vijay Kumar. Lecture for Indian Administrative Service 2019 batch in AP HRDI (March 29, 2021).

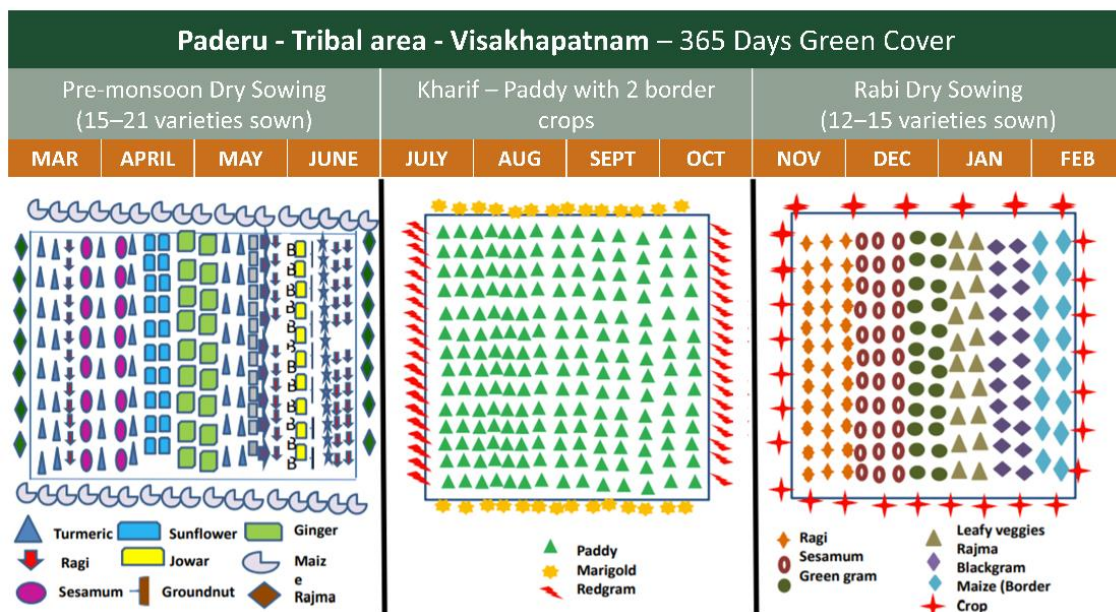


Figure 5. Increase in crop production, diversity and sources of farmers' income with the application of PMDS techniques.

Source: Andhra Pradesh Community Managed Natural Farming: A System-wide Agroecology Transformation for people and planet. T. Vijay Kumar. Lecture for Indian Administrative Service 2019 batch in AP HRDI (March 29, 2021).¹⁶

¹⁶ Currently, no independent study is available on PMDS that shows its economic impact on the farmers and environmental impact on the soil.

Some studies question the efficacy of NF when compared to conventional farming with regards to productivity (Kumar et al. 2020; Smith et al. 2020). Further independent, long-term, in-depth field studies with robust methodologies are required to understand the real impact of NF on farm productivity and farmers' income.

Environmental

Low energy and water requirements. It is observed that NF for irrigated crops results in 55-85% lower emissions, with 45-70% less input energy compared to conventional farming. In rainfed areas, this difference ranges from 85-99% for energy emissions and 42-90% with regards to input energy (Suresh et al. 2019: ii). The study also reports a reduction of 50-60% in water requirement for selected crops grown using NF techniques (ibid).

Crop resilience and soil biodiversity. Farmers benefit from implementing NF techniques through improved water holding capacity of the soil, increased organic carbon, enhanced microbial activity and improved balance between the pest and predator populations (Winowiecki and Hussain 2021). All of these lead to healthier soil and crops. In a limited sample study, 52% of farmers practicing NF reported that their soil softened from practicing NF and 43% observed Earthworms in their fields (Galab et al. 2019: 19). At the same time, natural farmers have reportedly observed an increased number of Earthworms on their fields. The average number of Earthworms per square meter in the NF plot is 46.83 as compared to the conventional plot where it is 5.71 (Kumar 2021). At the same time, a study by Kumar (Kumar et al. 2020) shows that there is a need for long-term independent field studies that aim to understand the impact of soil microorganisms on nutrient exchange in the soil systems.



Jeevamruthan preparation (photo: RySS).

Social

Nutrition. As farmers practice NF not only for commercial purposes but also self-consumption, their dietary diversity has likely increased and nutritional intake has gone up (Kumar 2021). Earlier farmers used to consume only staple food such as ragi, rice and leafy vegetables. With NF produce, they also have more access to nutrition via fruits and vegetables¹⁷ (ICRAF and RySS 2020: 48).

Safe food. By shifting away from chemical pesticides, farmers would be able to mitigate the health effects and hazards in two ways: (1) reduced exposure to chemicals; and (2) improved health from consumption of chemical-free foods¹⁸ (G.M. Muralidhar, Senior Consultant, RySS, August 16, 2021).

3.1.4 Success factors

This section highlights key interventions that enable success factors of innovation and scaling up of Andhra Pradesh Natural Farming.

Characteristics of innovation

Engaging farmers as innovators. The following two-pronged philosophy has enabled the emergence of distributed innovation: (1) The leadership does not have all knowledge or solutions; and (2) all farmers are innovators. RySS noticed that once introduced to a new technique, farmers' nature is to first experiment with the technique on small plots of land before adopting it on the farm (G.M. Muralidhar, Senior Consultant, RySS). Once farmers learn about principles of NF via demonstrations, talks, etc., by the CRPs, they take their own time to experiment with the practice in their own fields. Moreover, the CRPs only demonstrate the techniques once the farmers show interest and curiosity. This demand-driven nature of the program combined with a peer-to-peer, experiential learning model enables the farmers to absorb the knowledge and combine it with their own traditional knowledge in their context, at their own pace. Gradually, they start trusting the program and taking ownership. Ownership of the farmers is not only important for innovation but also for scaling up the program and its sustenance in the long run. Thus, Andhra Pradesh Natural Farming evolves as farmers find new crop combinations and apply natural inputs in different ways.

Flexibility in program design and funding

Financial flexibility. It is observed that during the early years of the program, a preliminary philanthropic donor was flexible in how the funds were allocated by RySS to achieve a shared vision of NF in Andhra Pradesh. Such flexibility in fund allocation supported experimentation at the ground level and the evolution of NF practices. As the program scaled up from 40,000 farmers in 2016 to more than 500,000 farmers in 2021, RySS ensured similar flexibility was received in funding from KfW, as explained previously (G.M. Muralidhar, Senior Consultant, RySS, August 12, August 16 and October 8, 2021). With no prescribed conditions on the methodology of employing funds, RySS has the programmatic flexibility to change strategy, NF techniques and collaboration with community members. This combined with the patience shown by funders allows innovative program design as it scales up.

Flexibility in designing solutions. As mentioned previously, RySS leadership is aware that there is no silver bullet to solve diverse problems with one blanket solution. Such openness to innovation trickles

¹⁷ We have not been able to find any studies that have explicitly examined the impact of Andhra Pradesh Natural Farming on nutrition.

¹⁸ We have not been able to find any studies that have explicitly examined the impact of Andhra Pradesh Natural Farming on food safety.

down to the staff and community from the executives of RySS and has enabled a greater level of experimentation on the ground.

Responsiveness of RySS to the community. As depicted in Figure 3, RySS has created effective channels of communication with the community through the CRPs. Using these bottom-up channels, RySS can respond to the demands of the farmers and their willingness to engage in NF. According to farmer demands, RySS can gauge and steer programmatic evolution and deepen the spirit of collaboration with the community.

Choice of scaling pathway and strategy

Capitalizing on existing social capital. The following interventions in the enabling environment enabled the scaling up of innovations in Andhra Pradesh Natural Farming.

Identifying leadership at the community level. For innovation to flourish beyond the top level of RySS, the leadership had to identify and reinforce the experimental nature of farmers. RySS staff observes that there are some champion farmers (or early innovators) who start implementing and experimenting with NF techniques soon after being introduced to the concepts. Once these champion farmers see the results of NF techniques on their fields, they become living examples of success for the others. RySS capitalized on the experience of champion farmers to showcase success to other farmers and scale up the adoption of NF. RySS understands that championing farmers create significantly higher traction among the farmers than prescription of farming techniques by non-farmer such as scientists and agriculture extension officers.

Social mobilization through SHGs. Andhra Pradesh Natural Farming experienced success in outreach upon engaging with women-led SHGs who were previously engaged in other development programs in Andhra Pradesh. As part of the earlier programs, SHG members had already undergone training. With such training came a sense of responsibility and discipline among the SHG members that helped the Andhra Pradesh Natural Farming program maintain consistency at the community level. Moreover, the trust among the members was an important success factor for acceptance of the program by any community member. SHGs are also trusted by the community members and have structures in place to support the financial management of the program. Thus, they played a key role in scaling up the adoption of Andhra Pradesh Natural Farming, and RySS can leverage their multiplier effect rather than reaching out to individual farmers.

Government ownership at all levels. It is observed that apart from motivated leadership, successful scaling of a program also requires motivation and buy-in of field-level government officials. To ensure that RySS is not perceived as an alternate institution by the government officials, Andhra Pradesh Natural Farming has deputed officers of the agricultural department as RySS program officers. By converging resources at top and field levels, the program is able to achieve greater buy-in from government officials. Their sense of ownership which comes through the leadership at the government level plays an important role in the implementation and scaling up of the program. This is different when compared to other states where NF has scaled up as a bottom-up movement. For example, in Karnataka, the farmers' community and NGOs were the main drivers of NF. It was champion farmers such as Subhash Palekar who harnessed the support of the community and nudged the state government to act toward scaling up support on NF (Khadse et al. 2018).

Characteristics of leadership

Andhra Pradesh Natural Farming has benefited immensely from the uniquely able leadership of T. Vijay Kumar. For instance, his charismatic style and ideas has been inspiring the cadre; his experience of building the National Rural Livelihood Mission has enabled successful capitalization of women's SHG networks for the adoption of NF; and his rich experience and network in Indian bureaucracy as a past bureaucrat in the Indian Administrative Service has enabled support and traction on various fronts. Given such a unique confluence of skills and experiences, there remains a concern among the stakeholders about the replicability of the success of Andhra Pradesh Natural Farming program.

3.1.5 Ongoing challenges

Balancing efficiency and effectiveness. As the leadership is open to change and the program structure constantly evolves according to the needs of the enabling environment, it becomes imperative for such changes to trickle down to the staff and community levels. It is difficult to maintain efficiency in meeting long-term objectives with such continuous evolution. Thus, the program comes across the challenge of maintaining effectiveness and efficiency at the same time.

Financial and technical support for rapid scaling up. The leadership is constantly looking for ways to produce social capital for scaling up in Andhra Pradesh and deepening NF practices. Simultaneously, the leadership is also looking for programmatic funds that can be directed toward team management and scaling up, and technical funds which would support the implementation of the program and constant experimentation of NF solutions. The program has not yet found ways to generate or secure adequate social capital and financial capital quickly.

3.1.6 Concluding remarks

Andhra Pradesh Community Managed Natural Farming (Andhra Pradesh Natural Farming) aims to promote NF practices among all farmers of Andhra Pradesh, to counter the ongoing challenges of changing climatic conditions including desertification along with high production costs of conventional farming. The solutions of NF are constantly evolving in the program through the process of distributed innovation. In the context of Andhra Pradesh Natural Farming, distributed innovation means that innovation takes place not only at the leadership level of RySS but is distributed among the RySS staff and users of NF, i.e. farmers.

As the community members and the end-users of the program are given the opportunity and agency to innovate, innovation happens beyond the executive management and leadership of Andhra Pradesh Natural Farming. Social capital in the form of a community cadre is the key to successfully scaling up innovations in Andhra Pradesh Natural Farming. The RySS field staff (CRPs) are one of the main sources of knowledge for farmers, as they provide training and technical support in a non-prescriptive manner. At the same time, champion farmers who experiment with NF solutions are an exemplar for the rest of the farmers to start testing solutions. SHGs play an important role in outreach and scaling up of the program through their widespread network in villages. Leaders of RySS and their funders are aware that there is no silver bullet for complex challenges faced by farmers in Andhra Pradesh. The patience of these stakeholders combined with the ownership shown by the government has made Andhra Pradesh Natural Farming a successfully scaled-up program. Moving forward, the program needs to continue to find financial stability and generate a diversity of scientific evidence as it gains traction in the international community. Additionally, more independent impact studies are required at various levels – at the field level, locally in various farming situations, as well as at the state level.

3.2 Safe Harvest Private Limited



Members of a collective (photo: Safe Harvest).

3.2.1 Background

Safe Harvest Private Limited is a triple bottom line¹⁹ company retailing “pesticide-free” food with publicly available records of its product testing for chemical residue. It was the first in India to retail products under this category where agricultural produce is grown under NPM practices.

NPM practices focus on transitioning from using synthetic chemical pesticides toward using bio-inputs and maintenance of soil health and in-situ moisture. Safe Harvest’s civil society organization partners develop context-specific packages of practices to implement with their farmers over time. Herein, the use of chemical fertilizer is limited and done in conjunction with a progressive increase of organic manure and biofertilizers. Since most farmers are located in rainfed regions, practices are centered around maintaining in-situ moisture of the soil. Therefore, water smart agriculture is also implemented along with NPM. These packages of contextualized environmentally friendly practices ensure production of safe foods, while maintaining agricultural yields which can dip during a full transition to organic practices. This makes NPM more accessible and implementable for small and marginal farmers who cannot afford reduced yields (Safe Harvest). Furthermore, NPM offers a transitional model to more environmentally positive agricultural practices.

Safe Harvest directly sources the NPM grown produce (flours, pulses, beans, cereals, whole grains, millets, spices, herbs, sugar, sweeteners, etc.) from Farmer Producer Organizations (FPOs)²⁰ situated across 12 states of India. These FPOs promote and adhere to NPM practices with their members and are aligned with Safe Harvest’s vision to make safe foods available. Safe Harvest ensures that there are no chemical pesticide residues or adulterants via rigorous testing during the storing, cleaning and value addition processes of the consumer food products. Currently, Safe Harvest works via a farm-to-kitchen model (Figure 7) making their products available at a comparative price point (pricing the products at only 10-20% higher than conventional products) to branded conventional food products via big retailers pan-India (both brick-and-mortar stores and popular e-commerce platforms such as Flipkart and Big Basket) (Rangu Rao, CEO, Safe Harvest, October 2, 2021). This taps into the middle-income consumer market, especially where there is an awareness of and demand for “pesticide-free” foods for health and safety. Safe Harvest works with over 100,000 farmers via its FPO networks across 12 states, most of whom are small and marginal farmers, including close to 2,500 tribal farmers (Safe Harvest, September 23, 2021).

With the goal of addressing the lack of market access to small and marginal farmers and supporting environmentally positive agricultural practices, in 2005, eight NGOs who had been working with agricultural communities and environmental sustainability at the grassroots level founded the Non-Pesticide Management (NPM) Network with funding from Ford Foundation. The initial grant via Ford Foundation was essential for the NPM Network to build its collaborative capacities, deepen the understanding of NPM practices, pilot Safe Harvest’s business model and develop the capacities of their partner FPOs. Moreover, it was key in bringing alignment in terms of vision and knowledge as founders understood the need for long-term interventions and active relationship building given the

¹⁹ Triple bottom line is a business concept wherein firms are committed to measure their social and environmental impact through three Ps: profit, people and planet. (<https://online.hbs.edu/blog/post/what-is-the-triple-bottom-line>).

²⁰ FPOs collectivize farmers and thereby increase their access to resources and scope for livelihood generation. FPOs are legal entities composed of primary producers (here, farmers) where profits are shared among members. It is an umbrella term for Farmer Producer Companies, farmer cooperatives and societies.

nature of their challenge. In 2009, Safe Harvest was registered as a for-profit company to address their goal of bridging market access for “pesticide-free” produce for small and marginal farmers.

The NPM Network and Safe Harvest understood chemical-pesticide-free farming as more economically viable and practical for small and marginal farmers in India, as opposed to organic farming, where they would also need to give up chemical fertilizers. This was because most small and marginal farmers cultivate low fertility soils and therefore cannot comfortably give up chemical fertilizers. Furthermore, a possible yield dip in the transition period during a complete phase-out of chemical inputs would be more drastic for small and marginal farmers. Chemical pesticides also have an immediate and much more hazardous impact on human health (especially on farmers who have direct contact) and the ecosystem (Bhardwaj and Sharma 2013; Sharma and Singhvi 2017), while transitioning out of them is more accessible without compromising on yields and productivity. The limitations for small and marginal farmers, who also make up the majority share of farmers in India (Agriculture Census Division 2019), are exacerbated by stagnating agricultural incomes in India and issues of access to resources (financial, technical, etc.). Given that Safe Harvest’s farmer demographics were already engaging in farming with minimal or no chemical pesticides due to lack of affordability, accessibility or availability of chemical inputs, the NPM approach became a far more scalable option as opposed to completely synthetic chemical-free farming practices.



Meera Bai, a non-pesticide management farmer, vermicomposting (photo: Safe Harvest).

As Safe Harvest emerged from grassroots work with agricultural communities, their services are rooted in the needs and the priorities of these communities. The biggest challenge facing small and marginal farmers has been market access and product differentiation for existing NPM products, both of which have tremendous impacts on their livelihoods as they are not able to get fair pricing or differentiate their products. Safe Harvest built upon existing NPM practices of small and marginal

farmers and the nascent level of farmer organization²¹ in India, to build a new market category, a well-controlled supply chain and a market for these products. They decided to establish business relationships at the FPO level instead of procuring produce from individual farmers because of the perception that there is no alternative, given that the NPM movement focuses on smallholder farmers. It was clearly understood that NPM cultivation could not be adopted by individual farmers and there was a need for collective efforts given issues around cross-contamination from neighboring fields, etc. By focusing on farmer collectives and hand-holding from production to processing at the FPO level, they are able to mitigate against risks of cross-contamination and to procure the bulk quantities needed.

Additionally, each NPM farmer would have a limited marketable surplus which would be impossible to tap into the organized bulk and retail markets with. Farmer collectives were, therefore, the only way forward. This also reduced their cost of transactions while ensuring an indirect reach to a much broader farmer base. In an effort to build a pan-India NPM movement committed to food safety and farmer access, Safe Harvest also ensured the training of FPOs on market preparedness, value addition, aggregation and storage so that it could build its supply chain partners.

The process of certification, the transition period with reduced yields, and the costs associated with organic cultivation weren't affordable to most small and marginal farmers. The creation of a new category of "pesticide-free" food by Safe Harvest and the decision to work closely with FPOs willing to adopt or work on NPM was an outcome of that understanding. Furthermore, Safe Harvest was conscious of keeping their product prices comparable to branded conventional products, so that a larger consumer base could also access them. By making "pesticide-free" produce accessible to price-sensitive middle-income consumers, who were excluded from the higher pricing of the organic products market, Safe Harvest has enhanced its potential scale of impact, multifold.

When Safe Harvest first came into the market, there was no pre-existing supply chain specifically designed for retailing chemical-pesticide-free products, thus risking cross-contamination. Furthermore, there was limited awareness of not only their brand, but also NPM products in general, and the importance of testing and evidencing claims on food products. Safe Harvest also had limited working capital, lacked experience in engaging with the market, and almost all of its FPO partners were accessing organized markets for the first time (Anil 2019). In a highly competitive market, maintaining relatively affordable pricing and ensuring product availability was a challenge. In 2012 and 2013, Safe Harvest was close to shutting down.

However, post-2013 they experienced a turnaround as Safe Harvest internally restructured its board, and Rangu Rao, a founding member of the NPM movement and Safe Harvest, stepped up as the CEO. The focus was shifted to building Safe Harvest as a commercial brand, optimizing the financial structure (debt to equity ratio), and ensuring market differentiation for "pesticide-free" products and evidence generation to support the claim for differentiation. In other words, Safe Harvest transitioned from its mission-driven, NGO-like approach to operating as a commercial social enterprise. In 2016,

²¹ Farmer collectivization is evolving in India and the necessary ecosystem to adequately support FPOs is still developing. FPOs require special support in their early years. NABARD reports: "Majority of these FPOs are in the nascent stage of their operations with shareholder membership ranging from 100 to over 1,000 farmers and require not only technical handholding support but also adequate capital and infrastructure facilities, including market linkages for sustaining their business operations" (NABARD 2020).

they received institutional funding in both debt and equity. Safe Harvest has garnered traction among consumers for its products with sales turnover reaching INR 26 crore (USD 3.5 million) in financial year 2019-20 (Safe Harvest). Safe Harvest tapped into the growing awareness around food safety in Southern India, which Safe Harvest observed to be stronger than the rest of India initially, to build its early consumer base, and was then able to build its presence as the awareness spread across India, especially in the light of the COVID-19 pandemic²² and increased consumer awareness around health and food safety. In 2019-20, their sales territories were limited to Chennai, Bengaluru, Hyderabad, Visakhapatnam and Vijayawada.²³ Now, this has expanded to include the National Capital Region and an introduction in Mumbai and Pune as well.

The “zero certification” mark on their products signaled the “pesticide-free” differentiation of their offerings. Further, by building the capacities of potential supply chain partners, Safe Harvest aims to strictly become the marketing partner for FPOs and outsource to its FPO supply partners the remaining supply chain function in the future.

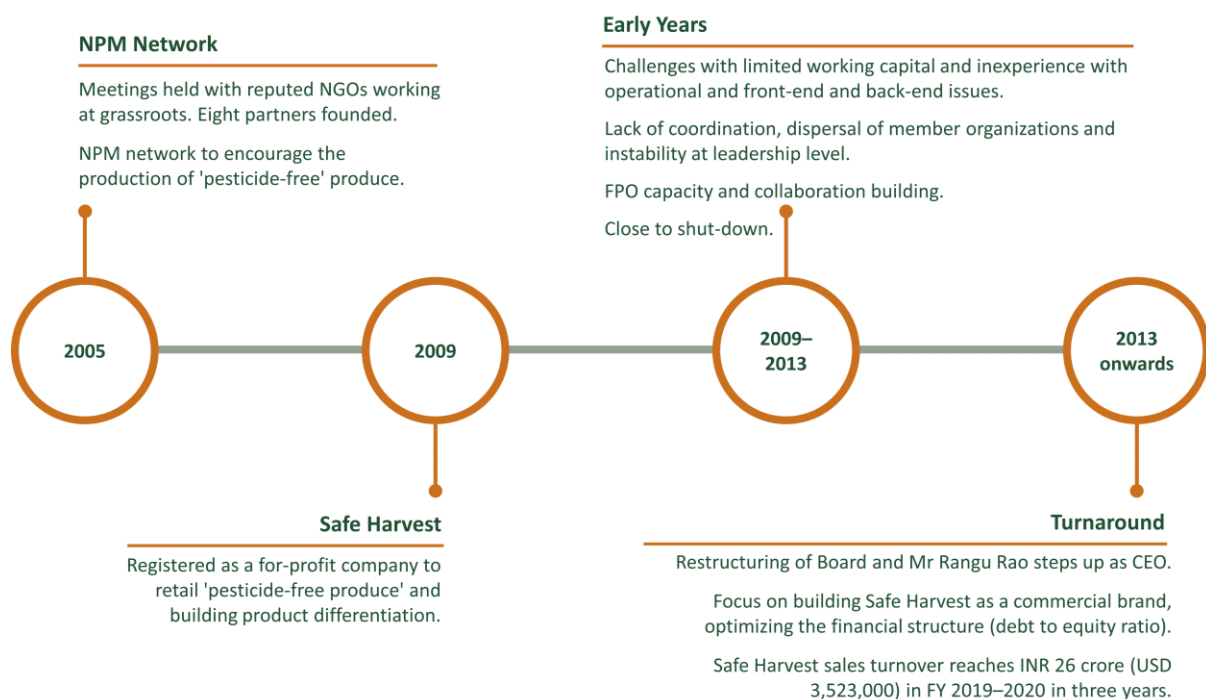


Figure 6. Timeline of key events in Safe Harvest.

Source: Authors’ representation based on interviews and Anil (2019).

²² The information is collected from informational interviews where it was stated that Safe Harvest did not actively invest in marketing via advertising on newspapers, billboards or TV. Safe Harvest used the on-shelf product availability and selection variety to register presence in multiple product categories) as the tactics of the limited promotion they did. According to their financial report, around 15-20% of revenue was invested in Marketing and Distribution. Their communication team and sales team work closely to catalyze the use of social media and direct consumer outreach for traction (Anil 2019). This also included offering consumer discounts through brick-and-mortar retail chains and ecommerce platforms, and increasing visibility on these platforms. From September 2021, onwards they increased focus on marketing while also increasing strategic engagement with digital resources as investments and Safe Harvest’s capacities have increased.

²³ The approximate populations in these cities as of the 2011 census are as follows: Bangalore 9.6 million, Chennai 4.6 million, Hyderabad 3.9 million and Visakhapatnam and Vijayawada around 1 million each.

3.2.2 Innovation in Safe Harvest

The core innovation at Safe Harvest is the creation of a new product category, “pesticide-free” food, and establishing the specialized supply chain required for it. In other words, Safe Harvest entered a space where the desired product category and the corresponding value chain didn’t exist and has transformed this context to successfully source and retail its products.

The existing two product categories were organic and conventional foods. The former can be extremely price exclusive and may have gaps between its claims and evidence of safety. The latter is prone to including products of an environmentally unfriendly means of production that is laden with hazardous chemical pesticides, dangerous in exposure and consumption. Safe Harvest actively built a third category of food products, “pesticide-free” products, driven by their mission of providing safe and healthy food for all while supporting smallholder farmers. They established their supply chain by developing FPOs as their partners capable of delivering on their vision and their promise of chemical-pesticide-free foods from farm to kitchen. Safe Harvest ensures this by providing end-to-end solutions to FPOs by also having their staff be present at facilities from harvesting to the final procuring. Moreover, they procure multiple commodities from different FPOs across India to ensure steady supply against environmental and supply fluctuation risks, and to ensure a diverse offering of products for consumers and brand visibility. Safe Harvest ensures rigorous compliance across its partners in the supply chain and ensures adherence to maximum residue limits for pesticides as per Jaivik Bharat (Organic India) standards set by the Food Safety and Standards Authority of India (FSSAI).

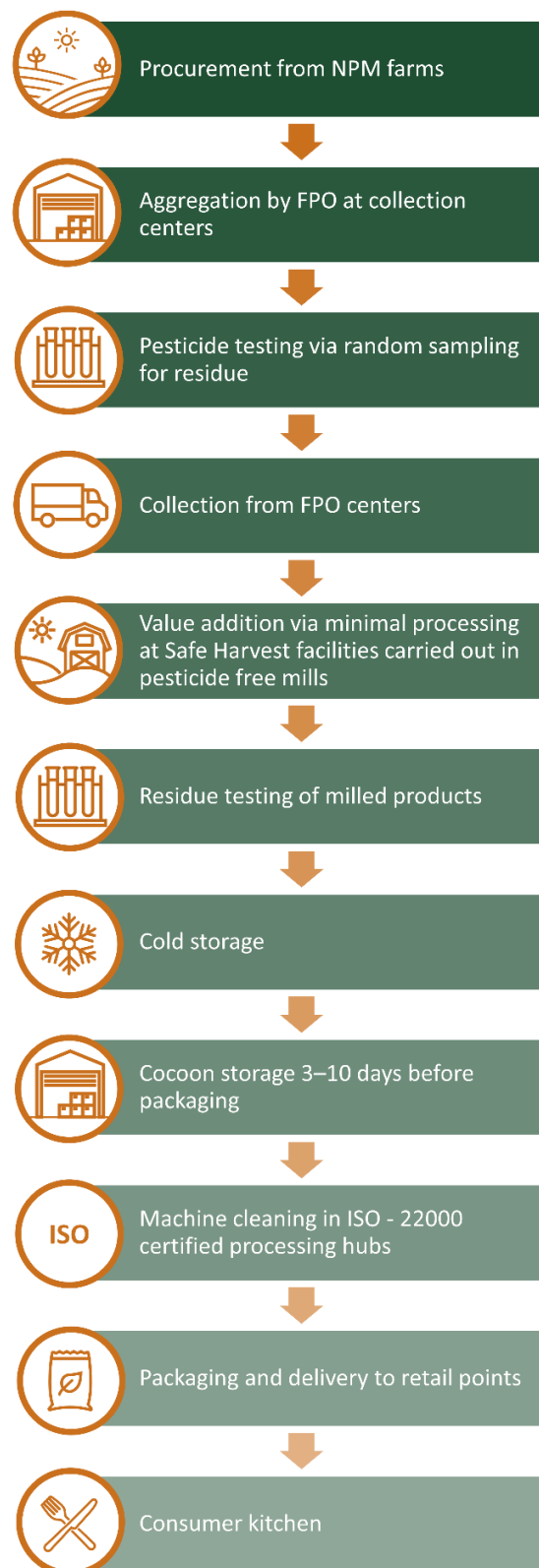


Figure 7. Safe Harvest’s flow of a farm-to-kitchen model.

Source: Authors’ reproduction based on Safe Harvest website, inputs from interviews and Anil (2019).

Over the years, the value of commodities procured from its FPO partners has increased from INR 16.66 crore (USD 2.22 million) in 2018-19 to INR 34.31 crore (USD 4.58 million) in 2020-21 (Safe Harvest, Financial Records).

One of Safe Harvest's key sub-innovations was their capacity to effectively plan and raise finances. Since Safe Harvest was introducing a third category of food, there was a longer timeline envisioned to establish the concept, build the market supply chain, bring economic returns and see a greater benefit to the public, especially as they worked with small and marginal farmers who were often more remote. Even without the existence of a supportive financial ecosystem for such an enterprise, Safe Harvest innovated upon its capacity to tap into varied sources of finance to suit its needs throughout its journey. The initial grant from the Ford Foundation helped establish the category by catalyzing NPM networks' efforts to help farmers switch to "pesticide-free" practices. This established the model for collaboration with its founding members and has also been consequential in building supply chain partners by supporting FPO training and development.

Post-2013, Safe Harvest raised four rounds of equity and was able to attract key impact investors like Ashish Kacholia who continues to support Safe Harvest in improving its financial credibility and in raising debt by bringing their market and investor expertise. The increased confidence from investors led to unique tripartite agreements with credit institutions and increased Safe Harvest's and their partner FPOs' operational capacity as the FPOs' resultant creditworthiness also improved. One of their key initial tripartite agreements to infuse debt was with Friends of Women's World Banking India and Ananya Finance as a direct lender, where Safe Harvest took the cost of financing and FPOs transferred custody of aggregate agri-commodities to Safe Harvest. The uniqueness here lay in Safe Harvest's willingness to pay loans on behalf of the FPOs. Taking interest liability of a separate organization, especially young FPOs without a credit history, isn't a common practice and instead marks the long-term perspective and commitment of Safe Harvest to its goals and support for FPOs. Now, having underwritten many such agreements, Safe Harvest has been successful in acquiring debt to support its operations and growth.

Furthermore, even certain FPOs invested in Safe Harvest in 2014-15 and hold part of its shares, to enable it to move forward on establishing the market linkage.²⁴ This also provided evidence of the FPOs' commitment to NPM and the direct market linkage via Safe Harvest. The innovations on funding have greatly enabled Safe Harvest to increase its volume and reach and establish the "pesticide-free" category.

Safe Harvest's innovation has, by actively building a context for themselves, built the context for other market players to also enter and retail under the "pesticide-free" category of food.

3.2.3 Outcomes and impacts²⁵

Social

Farmer and FPO development. Through Safe Harvest's network, FPOs gained skills in market preparedness, value addition, aggregation and storage. Twenty of these organizations selling to Safe Harvest have climbed up the value chain with Safe Harvest's support. Fifteen of them supply clean and

²⁴ At the time of writing the report, the shareholding matrix was as follows: various shareholders and promoters held 3.22%, FPOs held 0.5% and the principal investor held 96.28% of shares of the company.

²⁵ Information sourced via informational interviews unless otherwise stated.

graded agriculture commodities to Safe Harvest; one executes packaging of over 12 products for Safe Harvest's retail market while also supplying retail quality products; and five other FPOs are also able to supply Safe Harvest with retail quality products that don't require further processing or manual cleaning. These FPOs have also been able to increase their collective negotiation capacity and power with different potential buyers.

Health. Transitioning to NPM practices reduced the hazardous exposure to chemical pesticides, improving the health of farmers, their families and the community.²⁶ Consumers of Safe Harvest products also aren't exposed to pesticide residues in their food.

Consumer awareness. Via on-shelf presence under a wide range of product subcategories (flours, pulses, beans, cereals, whole grains, millets, spices, herbs, sugar and sweeteners), Safe Harvest has increased awareness of "pesticide-free" products and their benefits among not only its direct consumers, but also those who considered Safe Harvest products but decided not to purchase, evidenced by their growing consumer base and sales.

Improved transparency. FSSAI now mandates testing for pesticide residue for all agri-commodities. Safe Harvest has also always advocated compulsory residue testing and set the benchmark by being the first to have their testing information available publicly.

Economic

Organized market access. Safe Harvest enables access to a stable, profitable, transparent and organized market for 100,000 small, marginal and tribal farmers across 12 states.

Increase in savings and incomes. Safe Harvest transacts directly with FPOs. It offers farmgate prices that are comparable to those of the Agricultural Produce Market Committee (APMC).²⁷ Thus, farmers save on APMC commission charges and transportation fees, which is crucial since many of their farmers are located in remote areas (Anil 2019). Safe Harvest reported a reduction in farmers' input costs from INR 2,500 (USD 33.8) to INR 100 (USD 1.35) per hectare because of NPM practices (Safe Harvest). This is a drastic reduction in the cost of production, especially for small and marginal farmers with already limited financial capital. The amalgamation of reduced cost of inputs and increased savings led to a majority of farmers reporting a 20% increase in income (Anil 2019).

Due to assured market access and available working capital, FPOs can invest and upgrade their capital assets (Anil 2019). They are able to build capacity to vertically integrate value addition activities like aggregating produce, stockage, cleaning and grading, etc. which diversify their sources of income and capture a higher share of the consumer rupee.

Access to finance. FPOs are able to access finance via tripartite agreements between them, Safe Harvest and formal lenders. This has improved the creditworthiness of these FPOs and allowed them to deal with larger volumes.

²⁶ Studies evidence the ill effects on human health; thereby by reducing exposure to chemical pesticides, the scope of hazardous exposure is reduced (Grewal et al. 2017; Sharma and Singhvi 2017; Bhardwaj and Sharma 2013).

²⁷ APMC is a state government-established marketing board where farmers can sell their produce. It was introduced as a means to safeguard farmers from being exploited and regulating prices. Farmers need to bring their produce to certain locations called mandis, and there are APMC market fees, user charges, agent commissions and levies to be paid, whether a sale happens or not.



Preparation of bio-pesticides (photo: Safe Harvest).

Safe Harvest also supports partner FPOs to access formal credit from institutions like Nabkisan – a subsidiary of the National Bank for Agriculture and Rural Development (NABARD) set up to exclusively provide working capital to FPOs – and Friends of Women’s World Banking at reasonable rates which can be difficult to access for younger FPOs who may not yet have established a credit history. With formal financial access enabled by Safe Harvest for its FPOs, the government’s infusion of funds of up to INR 1 million (USD 13,345) under the matching equity program helped FPOs raise equity and resultantly proportionately higher debt. All of these in turn supported FPOs procuring and supplying agricultural commodities to Safe Harvest. Eleven FPOs have received loan linkage facilities via Safe Harvest from non-banking financial companies like Nabkisan, Ananya, Avanti and Friends of Women’s World Banking on different occasions, varying from INR 3 lakh (USD 3,998) to INR 3 crore (USD 400,384).

Environmental

Reduced hazardous pollutants. NPM training to farmers by Safe Harvest has reduced the entry of hazardous compounds into the ecosystem and the spillover to the overall food chain via taking out use of chemical pesticides.²⁸

Water smart agriculture. By focusing on limiting chemical fertilizers and progressively increasing organic manure and biofertilizers, in-situ moisture is maintained and the need for irrigation frequency per hectare is reduced. FPO partners are also mindful of the depth of irrigation for crops such as Kharif paddy as well. This increases the efficiency of water cycling through the system and therefore reduces risks of water quality deterioration in the region and increased water usage (Safe Harvest, October 2021).

Environmentally positive practices. While a 180° turn and transition from input-intensive farming to chemical-free farming models is very risky and difficult for small and marginal farmers especially, the adoption of NPM has created an essential stepping stone toward it. Many farmers have ‘upgraded’ to

²⁸ Studies evidence the ill effects of pesticides on ecosystems (Grewal et al. 2017; Sharma and Singhvi 2017; Bhardwaj and Sharma 2013).

further environmentally positive practices beyond NPM over the years, including a full transition to organic farming and other chemical-free farming models (P.S. Vijayshankar, Director, Nature Positive Farming and Wholesome Foods Foundation, August 17, 2021; T. Pradeep, Founder and Secretary, SAMUHA, August 17, 2021).

3.2.4 Success factors

This section highlights the replicable success factors and key interventions that enabled innovation and scaling up of Safe Harvest.

Relevance to Demand, Needs and Priorities of Users. Safe Harvest was incorporated to address farmers' lack of market access and the need to differentiate their "pesticide-free" products. The core innovation at Safe Harvest is the creation of a new product category, "pesticide-free" food, and establishing the specialized supply chain required for it. Safe Harvest continues to ensure its relevance to this demand of farmers. They understood the need for long-term engagement and identified relevant interventions. This ensured greater buy-in from partnering FPOs.

Characteristics of organizations/actors leading or driving the innovation and scaling process.

Capitalizable background of leaders. The founding members and leaders in Safe Harvest came from well-established NGOs with several years of field experience in agricultural development and working with small and marginal farmers. They were able to leverage their experience, knowledge and networks to build solutions²⁹ grounded in a nuanced understanding of immediate context and farmer needs.

Value-driven. Safe Harvest as an organization has been well aligned on its principal value of enabling safe and healthy food available to all by supporting small and marginal farmers. Safe Harvest ensured internal alignment on their values and the need for long-term thinking and trust-building. They understood the nature of the challenge and the solutions needed. This value alignment enables Safe Harvest to persist and invest in building themselves, their supply chains and partnerships through all ups and downs leading to their current growth phase.

Characteristics of innovation

Ensuring evidence to build trust. Safe Harvest as part of their mandate ensures that their claims are verified and reliable. They publicly share the results of their product test reports to back up their "zero certification" label that signifies "pesticide-free" food. This practice has reinforced the production differentiation intended by Safe Harvest.

Complementary partnerships. Safe Harvest effectively complements its development sector background in working with smallholder farmers with the market and commercial expertise of its investors and well-wishers. By also bringing in FPOs as partners, Safe Harvest enables their sense of



Safe Harvest's "Wheat Sharbati" product with "zero certification" mark (photo: Safe Harvest).

²⁹ For instance, the NPM Network supported Safe Harvest's FPO formation where they didn't pre-exist. This included the logistical support during the initial years of FPO formation so that they were well-established and other necessary training to ensure compliance with NPM practices. Partner FPOs also have access to credit via organizations like Nabkisan (subsidiary of NABARD) and Friends of Women's World Banking, which can be especially difficult for young FPOs and small and marginal farmers to access.

ownership. Such partnerships make Safe Harvest more able to bridge expertise gaps and strengthen its operational capacity.

Scaling pathway and strategy

FPO networks. Safe Harvest engages with networks of farmers via FPOs and other existing NGOs instead of individual farmers. This creates a multiplier effect and allows them to connect with farmers in 12 states at transaction costs multifold lower than those incurred in one-on-one farmer engagements. The number of partners that Safe Harvest transacts with has increased from 22 in 2018-19 to 30 as of August 2021. Additionally, Safe Harvest is working with 10 more organizations that are in the process of forming farmer collectives, and there are six to seven organizations where transactions will be happening shortly in financial year 2021-22.

Accessible pricing. Pricing the products at only 10-20% higher than conventional products enables Safe Harvest to unlock the price-sensitive but much larger middle-income consumer segment for their products (Safe Harvest).

Raising finance efficiently. Safe Harvest leveraged its networks and built relationships with institutions and individuals where they could mutually support Safe Harvest's financial needs and their partners' goals. Such partners included individual investors, institutional investors, formal institutional lenders and non-banking financial companies. Furthermore, even certain FPOs invested in Safe Harvest and hold part of its share. The diversified pool of funds, including grants, debt and equity from different funding partners, was put to judicious use by capitalizing on different funding mechanisms from different partners for fitting investment needs.



Women workers at a Hub (photo: Safe Harvest).

Product selection. Safe Harvest procure their produce from multiple states across the country to build resilience against environmental and supply variability. This not only supports the year-long on-shelf presence of their products but also broadens their product selection. Both these factors significantly increase the potential touchpoints with any prospective consumer. This way Safe Harvest could ensure a much greater market presence while remaining a lean organization. The number of commodities that Safe Harvest deals in increased from 40 in 2018-19 to 55 in 2021-22.

Characteristics of partnerships and the organizations/actors that served as partners in the innovation and scaling process

Alignment via long-term trust-building. A key characteristic of Safe Harvest's partnerships has been their core alignment on long-term vision and the approach required to achieve it.

Financiers. Safe Harvest's investors were focused on longer-term horizons on returns as opposed to the conventional shorter-term requirements of investors. Furthermore, they bought into Safe Harvest's capacity for social impact and its vision which persisted their buy-in through challenges as well. They provided key expertise that supported Safe Harvest's turnaround. Additionally, in the case of Ashish Kacholia, an individual who remains their biggest impact investor, he was a determined investor with the resources to take on a higher-risk venture with longer-term horizons. Similarly, in the case of Friends of Women's World Banking India, they were able to secure financing even as a new entity that was incurring losses, didn't yet have an established supply chain, and was working with "higher-risk" farmers (small, marginal and tribal farmers) because of the trust and vision they have built, evidenced by their institutional design and collaborative capacity. The support of its financiers has been a great enabler of Safe Harvest's impacts and its scaling.

NPM Network. The vision alignment with NPM Network ensured long-term thinking and trust-building. This took away from pressures for short-term benefits and instead nurtured long-term sustainability and collaborative capacity of Safe Harvest and NPM Network. Furthermore, NPM Network offered key support in training and developing the capacity of Safe Harvest's FPOs.

Suppliers. Safe Harvest chose to work with those FPOs who were aligned or open to aligning with their practice of NPM and producing "pesticide-free" foods. As they assured their commitment to working with FPOs and supporting them through the process of training and procurements, Safe Harvest was able to build good faith with them. This makes the process of developing supply partners for a new market context easier. Furthermore, as they built relationships with and supported establishing of FPO capacities, by providing consistent market linkage to the FPOs, Safe Harvest has grown from their support which has also attracted other FPOs to seek Safe Harvest as well. The FPOs investing in Safe Harvest evidenced the alignment and the synergy of their relationship.

3.2.5 Ongoing challenges

As the Safe Harvest example demonstrates, there are key challenges and needs in regards to financing based on long-term investments, continuous support and vision alignment that are key to the sustenance and growth of such enterprises. Building a category, getting shelf space, selling the products and reaching profits is a long journey that requires capital insertion and sustained support. Financiers are needed at different points of the enterprises' journey, to support the unique needs in that stage, and can support the enterprise's sustainability and growth as is evidenced in the case of Safe Harvest. More so, this is because, unlike tech-based startups that can solely rely on equity, brick-and-mortar organizations like Safe Harvest require a mix of debt and equity. As debt isn't easily

accessible from formal financial institutions, entities like Safe Harvest have to rely on Non-Banking Financing Companies which can be expensive on occasions. Along with equity investors who are aligned on values and are open to investing in a longer-term horizon, support from formal banks to provide working capital at early stages over a longer period would enable such organizations to grow and bring results faster. Financiers or financing bundles who share the vision are aligned on the innovation model and have a higher risk appetite that can be sustained over a longer horizon are needed for such brick-and-mortar initiatives.

Furthermore, ensuring hand-off and the centering of farmers as key stakeholders is essential so that in the event if an investor wants to exist and sell, the institutional design is not compromised and the goals aren't lost. Finding and matching investors who can align with the vision where farmers are the final stakeholder and are willing to take on long-term investments is essential, and continues to remain a challenge. Safe Harvest has been actively engaging with its FPO partners to ensure their ownership of the value chain, to the goal of complete hand-off where Safe Harvest only remains as their marketing and branding partner. This would be central for other organizations within the social innovation or development sector as well to ensure impact beyond their tenure and direct circle of impact while also supporting systems resilience.

3.2.6 Concluding remarks

Safe Harvest demonstrates the capacity for impact when small and marginal farmers and their needs are centered in the innovation process. Safe Harvest created a new market category of “pesticide-free” products and supported its FPOs to become its supply chain partners. This was crucial for smallholder farmers who often do not have access to formal or consistent market linkages or appropriate pricing mechanisms and cannot viably transition to organic farming. Here, NPM and Safe Harvest's back-end design ensured accessibility for farmers in line with their vision for impact. Safe Harvest has been able to do this by keeping value-driven leadership at the helm. Additionally, we see the importance of trust, long-term engagement and collaborative capacities as part of the institutional design in building relevant and impactful interventions that support local economies and garner greater buy-in from farmer-partners. Here, transparency and inclusiveness in the journey, as opposed to top-down dynamics or transactionality in relationships with FPOs, mark key characteristics for successful partnerships. Moreover, operational sustainability is strengthened as farmers are positioned as primary stakeholders with a sense of ownership in the process. This is demonstrated in the greater independence and strength of Safe Harvest's partner FPOs which are now also engaging with other market players and inspiring other FPOs to join.

These initiatives require continuous support from financiers who share the vision and align on the innovation model, understand the need for longer-term horizons, and are willing/able to creatively support a growing organization's changing needs. Safe Harvest has been able to do this by tapping into a network of diverse financiers in grant, debt, and equity, and its example signals the need for an aligned investor ecosystem if a venture was to take on a similar challenge.

Empowering localized economies and contextualized financing mechanisms would build pathways for ventures like Safe Harvest to flourish and grow. Thus, the example of Safe Harvest introduces us to the possibilities of a well-supported, value-driven, grassroots-centered social enterprise and a need for a proper investment ecosystem to support the same.

3.3 Trustea



Inside a tea factory associated with Trustea (*photo: Trustea*).

3.3.1 Background

Tea is a top consumer beverage in India, and the country comes second globally in tea production (the first being China) (Jaisimha 2019). While historically tea was primarily cultivated for export purposes (Langford 2019), currently about 80% of domestic tea production is directed toward meeting its domestic consumption. This has also changed the landscape of tea cultivation; while tea plantations (where the acreage under cultivation is generally 200 ha and above) primarily cater to the global market, the supply to the domestic market comes from tea plantations as well as smallholders (Langford 2019). The smallholders include small tea growers (STGs)³⁰ who contribute about 50% of India's total tea production (Consultivo 2020). While plantations process their tea on-site in estate factories, smallholders transport their tea to both bought leaf factories (BLFs)³¹ and estate factories which then process the tea and sell it, either through auction centers or directly (Langford 2019). Historically, STGs and BLFs have often lacked knowledge on sustainable practices and the resources to adopt them, and the working conditions in both were often poor (AMRC 2010).



A tea estate associated with Trustea (photo: Trustea).

Given that the global market sources its tea from tea plantations, the Indian tea plantations that export tea are governed by global private standards such as Rainforest Alliance and Fairtrade to ensure that producers meet certain product and process standards (Langford 2019). However, since the exported tea is procured from a small pool of tea producers, these standards only govern a fraction of India's overall tea production. Further, smallholder tea producers in producer countries are disconnected from them, and concerns have arisen regarding the working conditions, health and well-being of farmworkers, the quality of tea, and the sustainability of its production (Langford 2019).

The confluence of the same actors in the global and domestic markets has facilitated the push for self-regulation among smallholder tea producers in producer countries (Langford 2019). While Unilever

³⁰ An STG is defined as a person who has a tea cultivation of up to 10.2 ha (<https://cec-india.org/small-tea-growers.php>).

³¹ A BLF is a tea factory which sources not less than two-thirds of its tea leaf requirement from other tea growers during any calendar year for the purpose of manufacture of tea (http://www.teaboard.gov.in/pdf/policy/Tea_Marketing_Control_order_2003.pdf).

and Tetley (owned by Tata Consumer Products) control 16% of the global tea market (Potts et al. 2014), about 45% of India's domestic market is controlled by Hindustan Unilever Limited (HUL), a subsidiary of Unilever, and Tata Consumer Products (TCP) (Singh et al. 2021). As early as 2007, Unilever had taken the lead in adopting Rainforest Alliance certification for all the tea sold by them in the European Union, and in 2010, the Unilever Sustainable Living Plan was released with a vision to shift to 100% sustainable sourcing by 2020 (Unilever 2010; Daleram Gulia, Procurement Manager – Sustainability, HUL, August 24, 2021).

To achieve this, Unilever attempted to introduce Rainforest Alliance certification across all their tea markets. But this proved hard to do in India, as there existed differences between Rainforest Alliance's code of conduct and Indian labor laws (Langford 2019). The minimum age for a tea worker that was permitted to work under the Rainforest Alliance code and Indian labor laws was different, for example.

In the face of challenges such as the fragmented nature of the smallholder tea industry in India, Rainforest Alliance's lack of outreach to the smallholder tea producers, and differences in product and process standards between global and domestic markets, Rainforest Alliance was not successful in bringing self-regulation among the smallholder tea producers as per its global standards (Langford 2019). While creating an India-specific Rainforest Alliance standard that aligns with Indian labor laws could have been easier, it also didn't want to create regional variation in its standards. These factors led to the recognition of the need for a domestic standard that was specific to the Indian domestic market context. HUL envisaged the establishment of a multi-stakeholder program based on industry realities and globally accepted sustainability principles. Further, it ensured that the program is mapped against the Unilever Sustainable Agriculture Code (a collection of Good Practices which aim to codify important aspects of sustainability in farming and to apply them to supply chains) for providing it with a robust and credible framework (Daleram Gulia, Procurement Manager – Sustainability, HUL, August 24, 2021).

Around the same time, within the tea consumer market in India, there was a growing awareness of the need for safe tea. The findings by Greenpeace (2014) on the presence of "highly hazardous" and "moderately hazardous" pesticides in tea samples collected from even big brands such as HUL, TCP and Wagh Bakri raised a hue and cry among tea consumers. To counter this, the Tea Board of India (TBI), a quasi-autonomous body under the Government of India that authorizes, registers and licenses industrial activities within the tea industry, came out with a Plant Protection Code 2014 (PPC)³² to regulate the use of pesticides in the tea industry. However, TBI didn't have the wherewithal to enforce the PPC. Moreover, the Indian NGOs felt that this move was insufficient to address the spectrum of challenges faced by the smallholder producers, such as deplorable working conditions (Langford 2019).

The interest and influence of governmental bodies in driving self-regulation in the Indian tea industry were not limited to that of India alone. The Sustainable Trade Initiative (IDH), a Dutch organization comprising private companies, NGOs, trade unions and the Dutch Government, drove for sustainability in the tea industry through its Tea Improvement Programme (Langford 2019). Their interest lay in addressing social and environmental sustainability issues within the supply chains of different food commodities. Upon seeing IDH's interest in funding standards for self-regulation within domestic markets, HUL approached IDH regarding creating one for the Indian tea industry (ibid.).

³² The PPC is a comprehensive guideline for safe usage of plant protection formulations in tea plantations in India (http://www.teaboard.gov.in/pdf/PPC_Version_13_pdf3115.pdf).

Later, IDH reached out to TCP for initiating a collaboration that eventually aided Trustea in being an industry-wide initiative. The joining of TCP also brought in the collaboration with the Ethical Tea Partnership (ETP), which later played an important role as one of the implementation partners in the verification of tea growers in Assam, West Bengal and Kerala, especially the small growers (Anurag Priyadarshi, Director – Sustainability, TCP, August 18 and 23, 2021).

To design a standard for tea production in India, Unilever approached Solidaridad Asia, an NGO based in Delhi (Langford 2019). Its parent NGO, Solidaridad, had previously played a key role in designing, developing and mainstreaming standards within the global markets of global firms for many commodities (ibid.). To improve the uptake of the certification among producers, Solidaridad also provided training to them (ibid.). Solidaridad Asia collaborated with HUL, and together they developed the initial draft for a standard of self-regulation for the tea producers in India that accounted for the intricacies in tea production in India's domestic market (Langford 2019).

Building upon this foundation, HUL, TCP and the IDH came together to launch Trustea in 2013, an Indian verification system and sustainability code for the tea sector. After the launch, HUL, TCP, IDH, ETP and Solidaridad co-created the final form of the code. Sector-level multi-stakeholder engagement, decision making and action via Trustea ensured that the further evolution of the Trustea code and its mainstreaming happened in a planned and strategic manner. With the initial support from a state regulatory body, TBI, Trustea further ensured that it did not face any administrative hurdles with the government.

The present Trustea code works toward overcoming the challenges of the tea industry and enables producers, buyers and others involved in the Indian tea businesses to obtain tea produced according to “agreed, credible, transparent and measurable criteria” (Trustea 2021). It engages with factories in estates, BLFs or grower group representatives for compliance and certification under the code, who then work with the production sites and the smallholders respectively. Trustea certifies the BLFs, and the chain of custody that is established here makes Trustea associate with STGs for their training and capacity building specifically through BLFs and factories in estates. Also, this chain of custody aids the latter group in keeping track of the quality of tea (Trustea 2021). Trustea is working with STGs, BLFs and factories in estates to address “key sustainability challenges such as food safety, stagnating yields, pest and disease control, living wages, worker welfare and equality, preservation of biodiversity, and improvement of livelihood of smallholders” (Trustea 2021). The stakeholders engaged with Trustea also consistently take note of the changes happening in the market, consumer demands and environment and upgrade or modify the Trustea code accordingly.

Trustea began its operations through funds obtained by main stakeholders such as IDH, HUL and TCP, which was later strengthened by the joining of Wagh Bakri Group in 2017. HUL and TCP have contributed equally to the Trustea code, approximately to the tune of INR 2 crore (USD 265,362) every year since its inception. IDH until 2020 contributed INR 3 crore (USD 398,044) every year and Wagh Bakri has contributed INR 50 lakh (USD 66,350) since its joining in 2017 (Anurag Priyadarshi, Director – Sustainability, TCP, October 18, 2021).

Given the lack of access to training and hand-holding, many of the STGs were unable to adopt the practices of the sustainability code. Though large tea estates had the resources and infrastructure to adopt the certification, they had to be aligned to the business case for being verified to the Trustea sustainability standard and the benefits of adopting the Trustea code had to be explained. Trustea

wanted the code to be accessible to every tea producer in India to create an impact across the domestic tea market. Currently, Trustea is transitioning toward adopting a new business model where they will monetize the Trustea seal on a retail pack. Meanwhile, Trustea will continue to provide free-of-cost training and capacity-building activities to all the stakeholders and the fee shall only be payable by companies who put Trustea seals on tea packages while selling tea to consumers. The seal is proposed to be introduced in the next six months, but until such a time as it reaches a break-even point, Trustea will continue to receive financial support from its funders.

Out of an estimated 250,000 STGs in India and 3.5 million tea workers (Rajbangshi and Nambiar 2020), Trustea has so far engaged with nearly 81,841 STGs and 640,000 tea workers (356,000 female and 284,000 male tea workers). The STGs who Trustea has engaged on average are 57 years old, have completed a primary level education, and the majority (approximately 90%) of them own an estate of fewer than 5 ha (Trustea 2021). Trustea has certified 695 estates and BLFs (Trustea 2021). Trustea verified approximately 56% of the total tea produced in India in the year 2020 (Trustea 2020).

Table 1: Key Points under the Trustea Code.

Trustea Code: Key points	
1. Management system and continuous improvement	Verified farms have an easy to maintain and practical management system in place for complying with the Trustea code and applicable legislative requirements.
2. Product traceability	Verified farms and facilities develop a clear and visually identifiable system for avoiding the mixing of verified products with non-verified products in its facilities.
3. Water management	Verified units ensure that they are using water efficiently, with minimal loss and optimal use.
4. Fertilizers	Proper selection of kind and volume of fertilizers, but also its safe application and storage.
5. Plant Protection Formulations (PPF)	The selection of Plant Protection Formulations (PPF), their use and storage are mandated as per the Plant Protection Code (PPC) of India.
6. Food safety	Adherence to the Indian Food Safety and Standard Act, 2006 for greater control over the quality, safety of tea and reduced rejections from national and international buyers.
7. Safety, health and welfare of the workforce	Verified units analyze and strive to prevent all potential adverse effects on the health or working conditions of workers and have an action plan in place to reduce and prevent the risk of accidents in the workplace.
8. Working conditions and workers' rights	The verified units must comply with national and state legislations on relevant labor legislations that apply to the tea industry.

Source: Summarized from the Trustea Code.

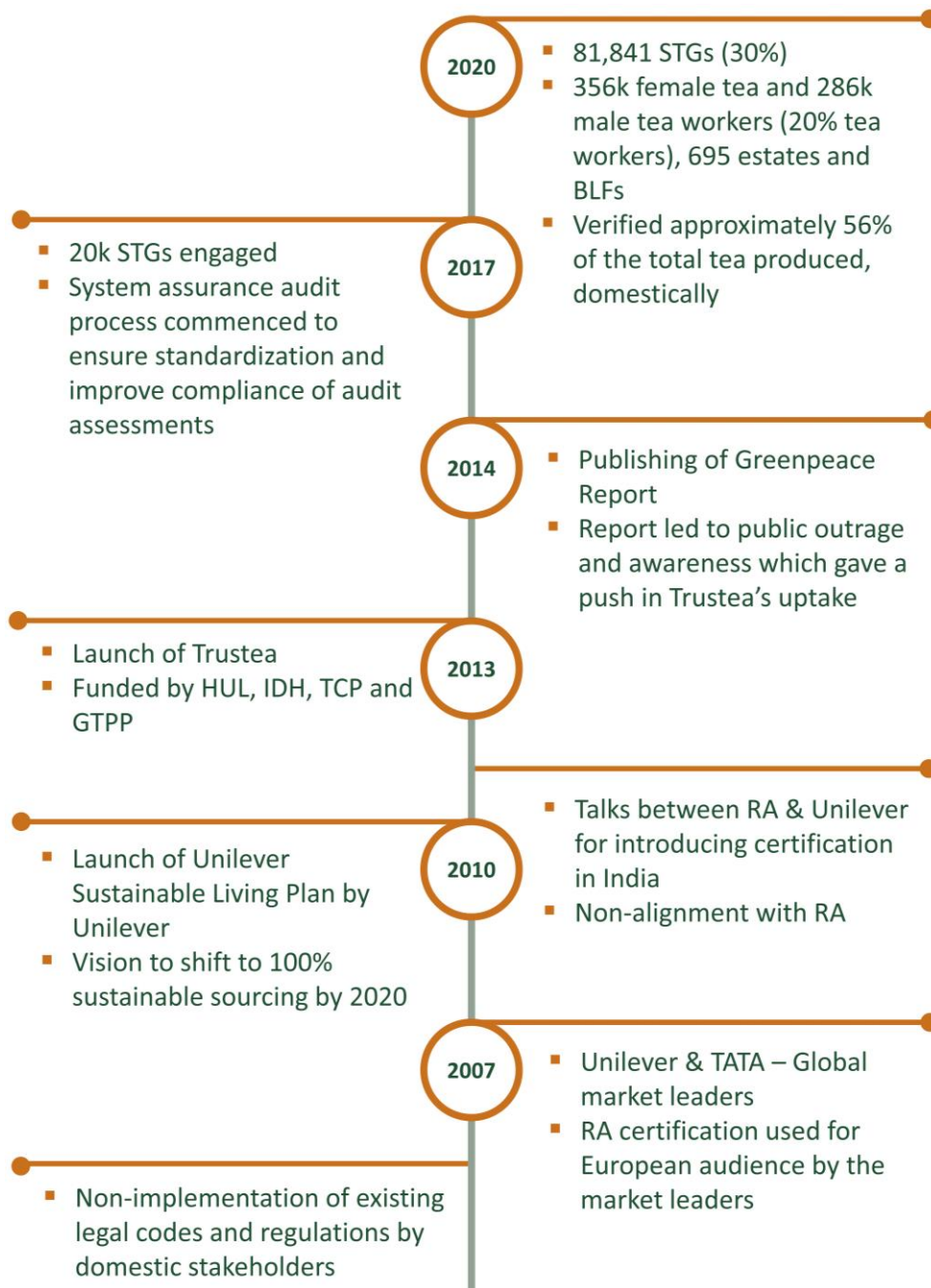


Figure 8. Timeline of key events.

Source: Authors' representation based on inputs from interviews and reports of Trustea.

3.3.2 Innovations in Trustea

*Innovation in Self-Regulation.*³³ The core innovation at Trustea is the process of self-regulation. Trustea has developed a certification code specifically tailored for the Indian tea sector and consumers to meet their needs and demands for social and environmental sustainability. It is a private sector response for providing quality and safe tea to the Indian market by ensuring that it is produced through sustainable methods. Trustea has been able to innovate and scale by driving innovations in the multi-stakeholder initiative and compliance up to the farmer level.

Innovation in the multi-stakeholder initiative. Trustea is governed and facilitated by a diverse and inclusive multi-stakeholder council with buy-ins from tea brands, tea producers (large tea plantations, STGs, BLFs), NGOs, civil society, research and academia. For ease of understanding, the council can be divided into two sections: the funding committee (IDH, TCP, HUL and Wagh Bakri) and the program committee (IDH, TCP, HUL, United Planters’ Association of Southern India, Indian Tea Association, Confederation of Indian Small Tea Growers’ Associations, Assam Bought Leaf Tea Manufacturers’ Association, Tea Research Association, Gujarat Tea Processors and Packers Limited, ETP and UN Women). The council is collectively responsible for taking all the decisions of Trustea in a consensual and aligned manner. The decision to have representation from various categories of stakeholders in the tea industry is a strategic one to ensure an impact and buy-in from the entire domestic tea industry.

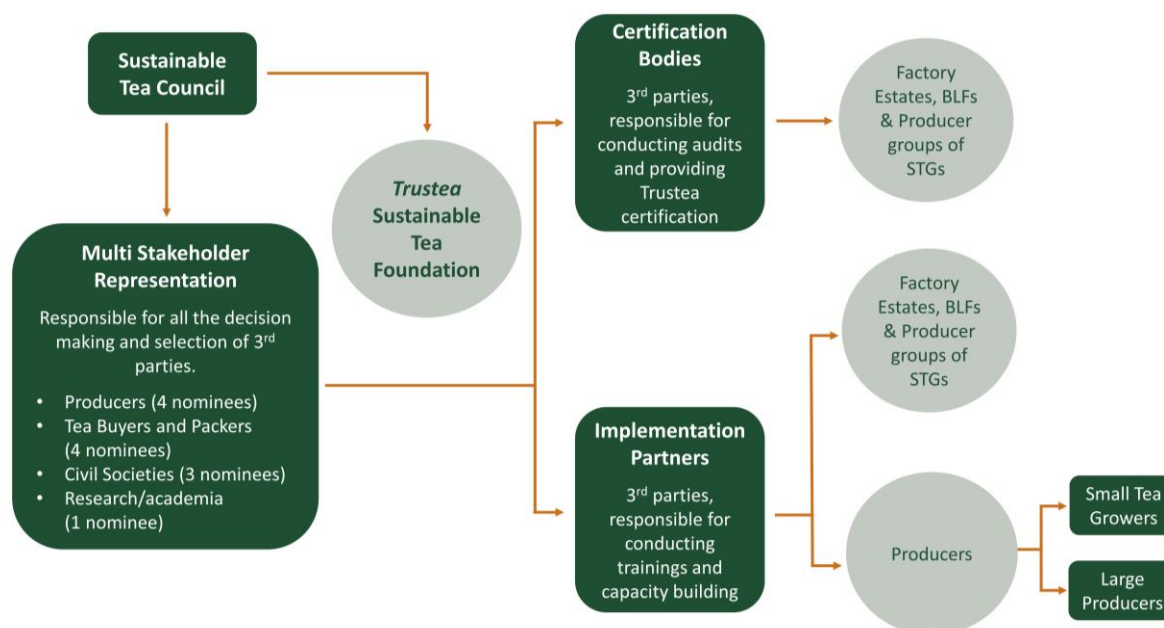


Figure 9. Representation of Trustea stakeholders.

Note: The right side of the figure showcases all the stakeholders that are engaged with Trustea.

Source: Official website of Trustea.

³³ Self-regulation in this context is defined as a private, market-driven innovative response or a regulatory process, setting standards for a particular sector in the absence of an adequate government policy/regulations/compliance mechanism (Gupta and Lad 1985).

Innovation in driving compliance. Unlike its peers, Trustea does not stop at just the verification but also invests in capacity building of the STGs, BLFs, tea workers and other tea producers to ensure compliance. A unique aspect of this procedure is that Trustea engages with STGs through factories in estates and BLFs. These factories share the list of such STGs that provide them with the produce with Trustea, and thereafter Trustea undertakes training of these STGs as per the requirements of the code. By establishing this chain of custody and putting the onus on these factories, Trustea has attempted to address the problem of chasing every STG for ensuring their compliance and adherence to the code. Further, this process also aids the factories and Trustea in maintaining traceability and quality of the produce because they are thorough with the resource person that provides them with the tea. Additionally, for building compliance, Trustea's capacity-building processes are tailored for easy comprehension by STGs and tea workers and employ community engagement,³⁴ community building and experiential learning.³⁵

Trustea has tied up with multiple entities such as the Tea Research Association, Action for Food Production, Reviving the Green Revolution (an associate of Tata Trusts), Ambuja Cement Foundation and the National Skills Foundation of India, which function as its implementing partners. These implementation partners are selected after a careful evaluation based on their alignment with Trustea and local presence and play an instrumental role in providing training and hand-holding support to the stakeholders. Implementation partners employ local personnel to provide on-ground support and execute capacity-building activities so that there are few issues concerning trust, language barriers and community/region-specific barriers. Audits on the stakeholders are conducted via third-party vendors to enhance objectivity.

3.3.3 Outcomes and impact

The key innovations at Trustea have delivered impacts across improving the environment, health and working conditions of tea workers, and wage equality between male and female tea workers. Some of the key impacts are as follows:

Environmental

Improved water and sewage management. Tea being a water-intensive crop, Trustea is actively encouraging the adoption of practices that improve water use efficiency and sewage management by mandating these practices. It has introduced extensive training and guidance on water management practices for its verified units. But so far they have not been able to verify compliance, especially of STGs, in this respect (Rajesh Bhuyan, Director, Trustea, Oct 11, 2021). However, it was noted that more than 50% of STGs associated with Trustea have introduced control mechanisms for chemical runoff and sewage across India (Consultivo 2020).

Improved soil efficiency. To enhance the soil quality of tea estates, Trustea mandates adherence to PPC and the use of FSSAI-approved chemicals within the allowed limits under its code. Trustea trains tea workers on safe usage and storage of fertilizers. Further, due to the training and capacity building

³⁴ Community engagement and building is performed by inculcating the practice of record-keeping, live demonstrations, training through multilingual animated videos, and has collectively helped in gaining maximum access to the community, their needs and their challenges.

³⁵ Trustea observed that information is comprehended better by STGs when it is explained through live demonstrations. Based on this understanding, Trustea devised the concept of model farms wherein tea growers learn to practice sustainable methods on farms, discuss their challenges and seek its resolution by trained personnel and fellow tea growers.

of STGs, adherence to the PPC has also seen noticeable improvement (Langford 2019). As a result, more than 80% of the certified STGs have been recorded to have adequate storage and segregation facilities in their tea gardens (Consultivo 2020).

Improved food safety. All verified STGs and BLFs have been introduced to food safety guidelines of TBI and FSSAI on good hygiene and manufacturing practices through systematic training and assessment programs. The training and knowledge have led to increased awareness of the guidelines and facilitated their compliance, resulting in higher production of safe tea (Trustea 2021).

Social

Reduced incidence of child labor. Trustea from the beginning has focused on achieving compliance of national and sector-specific labor laws among its target entities and STGs through continuous training. Its zero-tolerance approach and training on eliminating child³⁶ labor and wage disparity have reportedly led to the decrease³⁷ of the same at Trustea verified entities.

Improved health conditions for workers. There also have been systematic interventions for ensuring worker health and safety. Workers are given extensive training on the handling of fertilizers and the usage of safety equipment for the same. Further, the Trustea code makes it compulsory to use only those fertilizers and plant protection formulations that are safe, non-hazardous and approved by PPC. These practices have reportedly resulted in reduced³⁸ exposure to chemicals, and improvement in the health conditions of the workers.

Improved sanitary conditions for workers. Owing to COVID-19, Trustea has amped up the hygiene and sanitation requirements for its certified entities. The training and awareness on the same have recorded the establishment of sanitizer provisioning facilities in tea estates.

3.3.4 Success Factors

This section highlights the replicable success factors and key interventions that enabled innovation and scaling up of Trustea.

Specific Scaling Activities.

Evidence generation. Trustea specifically works with research/academic institutions to ensure that its practices are backed and validated by the scientific community. Presently, the Trustea council includes the Tea Research Association, which is the foremost body when it comes to looking after the research and development needs of the Indian tea industry. Its involvement gives credibility to the code's manual and guidelines. Further, it authenticates their requirements and benefits leading to an increase in the acceptability of the code among the stakeholders in the tea industry.

Providing economic value. Trustea provides support to tea producers and entities such as market intelligence on auction centers, purchasers, new varieties of tea, etc. Making such information readily accessible has ensured the interest and participation of STGs, BLFs and factories in estates in Trustea.

³⁶ As per the Child Labour (Prohibition and Regulation) Act, 1986, a child is defined as a person who has not completed 14 years of age.

³⁷ As per the information that was gathered from the answers of the interviewees.

³⁸ As per the information that was gathered from the answers of the interviewees and Consultivo (2020).



A training session organized for STGs by Trustea (photo: Trustea).

Creation of demand. The collaboration of Trustea with private market leaders and the initial support it received from TBI acted as a push and pull for the creation of the demand for sustainable tea and Trustea certification. The strong commitment of market leaders like HUL, TCP and Wagh Bakri, who collectively controlled more than half of the tea market, and their preference for purchasing only sustainably produced tea created the pull for tea producers to adopt sustainable production. The initial endorsements by government bodies, and later FSSAI, stepped up the legitimacy of the Trustea certification and created the push for its adoption.

Enabling environment

The 2014 Greenpeace report was instrumental in raising awareness among domestic tea consumers about the sustainability challenges of the tea sector. While TBI's launch of the PPC hoped to allay concerns regarding the safety of tea, TBI didn't have the wherewithal to enforce it. Furthermore, this move was considered insufficient in addressing the systemic challenges faced by smallholder tea producers. The gaps in the regulation of the domestic tea industry necessitated the introduction of a self-regulation mechanism such as Trustea's sustainability certification for the domestic sector.

Further, the initial support of TBI also led to ease in collaborating with other regulatory bodies like FSSAI which led to the development and standardization of safety standards for tea.

Characteristics of partnerships that served as partners in the innovation and scaling process

Complementary expertise. The diversity of the council ensured that Trustea had access to domestic and international expertise, market knowledge and networks to enable informed strategy and decisions. Its association with an international organization like IDH tremendously aided in the development and drafting of the code, due to IDH's expertise in driving sustainability in supply chains of food commodities (Langford 2019). The support of domestic implementing partners like ETP (associated with Trustea until 2019) and Solidaridad Asia (associated with Trustea until 2018) provided an in-depth understanding of the domestic tea market and its supply chains. Their technical expertise ensured the successful development of the field implementation chain for the code which resulted in higher compliance rates. Further, their field knowledge on the problems related to the production of

local tea was used in developing standards to address these issues. Trustea also benefited from the initial support of TBI which gave credibility to the code. The active role of TBI initially in chairing the Trustea meetings, sending out invitations to targeted stakeholders, etc. was instrumental in gathering support and approval of the entire tea industry on a large scale in a relatively short period.

Alignment on vision. The Trustea multi-stakeholder council has been able to function effectively as the stakeholders collectively recognize the need for sustainability standards in the tea sector. Trustea's practice of holding multiple pre-engagements talks with prospective council members before opting them eliminates any ambiguity in the understanding of new members regarding Trustea's mission and vision of driving sustainability and growth in the Indian tea sector.

This shared outlook of the council members also got transformed into a shared investment from HUL, IDH and TCP to support Trustea. HUL and IDH brought the first funds and their commitment and initiative effectively reinforced the credibility of Trustea. This motivated other stakeholders to step in with their funds too.

Well-designed operational processes. Trustea council's set of operational processes for decision making by its members, a set procedure for voting, etc., aids in developing trust among them and in decision making on a consensual basis. Additionally, it is strictly enforced that all activities of Trustea are in a pre-competitive space and the only objective of the collaboration among stakeholders is for achieving the common goals of the Trustea program. These pre-competitive agreements also act as a basis for establishing institutional mechanisms between them for ease in communication, collaborative working and problem solving.

Clarity on funds. The amount of funds contributed by the funding partners is allocated against the activities that are planned for that particular year. This clarity, flexibility and transparency on the funds and their usage work as a catalyst for establishing trust among the funding partners.

Relevance to demand, needs and priorities of users

Tailored capacity-building solutions for farmers. Trustea as a business model believes that a high compliance rate can be achieved among financially and educationally weaker audiences through interactive learning. Research states that these audiences comprehend information better when it is explained to them via live demonstration (Consultivo 2020). Based on this understanding, Trustea created the concept of model farms³⁹ and animated videos that were tailored according to the needs of STGs. Further, the training manuals and education modules under the code are also creative and interactive and are made available to the STGs in their regional languages.

Characteristics of the innovation

Reliance on technology. To enhance the overall reach and effectiveness of the program and increase the engagement among the stakeholders as well as with Trustea, the latter has launched three initiatives so far: 'Trustea eLearning', 'Tracetea' and the 'Database Management System' (Trustea DBMS). These initiatives are still in the implementation stage. Tracetea is a digital platform and a traceability application where STGs can register, conduct business and discuss their problems, suggest solutions and interact with other STGs from all across the nation. Presently, the application is in its

³⁹ Under this concept, an STG's farm/tea estate is selected and developed by Trustea as a learning arena for other STGs, known as a Model Farm. These farms are created in different regions and aid in teaching the STGs through live demonstrations of the practices that are part of the Trustea code.

pilot phase and has been successfully implemented in West Bengal, Assam and South India (Trustea 2021).

Characteristics of the organization

Flexibility. Although the Trustea model is definitive on its vision and goals, owing to the diversity and magnitude of the Indian tea sector, the model is flexible and makes changes based on feedback received from the stakeholders. This facilitates high acceptability and compliance with the code. The initial version of the code that was launched in 2013 received a lot of feedback from the stakeholders which was later re-worked into the code. Further, in order to enhance the credibility of the Trustea code and accredit it with the globally accepted sustainability principles, Trustea has become a community member of the ISEAL Alliance, a global organization working toward tackling sustainability issues through a collaborative approach.

3.3.5 Ongoing challenges


Climate change. Tea is sensitive to the environment in which it is grown. Any change in these environmental conditions has the capacity to affect the quality and quantity of the tea. The change in climatic conditions of tea-producing areas of India is already being witnessed in the form of erratic rainfall, pest infestation, changes in temperature, etc. (Nowogrodzki 2019). However, the Trustea code is yet to introduce guidelines on adapting to climate change for its verified units.

Traceability. Trustea engages with STGs through factories in estates and BLFs. The BLFs and factories are stringent in ensuring that STGs provide them with tea produced as per the Trustea standard. Though this chain of custody helps the BLFs and factories in maintaining traceability and quality of tea, certain aspects bring down the efficiency of this process. The tea produced by BLFs and factories, apart from being sold to big private players, is also sold through auction centers. The buyers at these auction centers are mostly retailers who may or may not be particular about the sustainability aspect and the quality of the tea. When tea is sold to such retailers, there arises a possibility of BLFs and factories not being sufficiently compliant with the certification code. Though Trustea has introduced the Tracetea traceability application for overcoming this problem, the application is still in its pilot phase and has a long way to go.

Demand-side challenges

Public procurement. Government institutions such as Indian Railways and the military Canteen Stores Department are major bulk buyers of widely used commodities like tea. However, Trustea is yet to tap into this market. This requires traversing a long procedure that involves a multitude of factors without a sustainability-focused policy framework, advocacy, lobbying, consumer demand, etc. Though Trustea had the initial support of TBI, given the lack of coordination among different government ministries and departments in India, that initial support will not help Trustea in this respect.

Consumer education to recognize and reward sustainable brands. Sustainability as a concept in tea is still at a nascent stage in India. Though Indian consumers are slowly beginning to recognize the importance of consuming safe and sustainably produced tea, there exists a clear lack of knowledge and interest in recognizing and rewarding tea brands working on these parameters. Brands that have faced similar challenges in different industries in the past have spent a lot of time and funds to overcome them. For example, in order to get Indian consumers accustomed to sanitizing their hands, the Savlon brand launched a massive campaign in India with the hashtag #NoHandUnwashed (Exchange4Media 2020). Given this backdrop, it will be interesting to witness how Trustea as a



sustainable tea brand can overcome the existing gaps in consumers' minds and create a space for its Trustea seal in the Indian tea market.

3.3.6. Concluding remarks

The journey of Trustea shapes an important lesson in terms of how an impact is created on an entire value chain through strategically planned bundles of interventions. It has emerged as a significant player that has successfully set up an India-centric sustainability standard for the Indian tea industry. Through its targeted focus on establishing a multi-stakeholder council and capitalizing on the skillset of its council members, Trustea ensured support from all the key private players of the tea industry. One of the most notable outcomes of the council was its ability to maximize the market hold and strength of players like HUL and TCP and pull tea producers toward sustainability. Further, the success of this multi-stakeholder initiative highlights the significance of having alignment, clarity on goals and well-defined operational procedures among the collaborators.

The additional support offered by TBI initially played an instrumental role in Trustea gaining acceptability in the tea industry, underlining the ease which comes from having the backing of a state regulatory body. The focus of Trustea on creating tailored capacity-building activities for its targeted audience (STGs, BLFs and factories in estates) led to high compliance with its code. Further, the approach of working with varied value chain actors and creating dependency among these actors worked as a key for ensuring the smooth operation of value chains and also developing accountability. The inclusivity of the program in terms of its collaboration with locals worked as another important factor for its scaling and outreach to a diverse crowd. Additionally, the continuous internal and external audits have aided the Trustea code in keeping track of its compliance rates and addressing the gaps in the same.

The above backdrop sets the context which led to the impact that Trustea has been able to create on various parameters. While it has achieved a noticeable scale, it will be interesting to see how the program can adapt and maintain its growth, build its brand image among Indian consumers and deal with changes in climatic conditions.

4. Conclusion

The cases covered in this report – Andhra Pradesh Community Managed Natural Farming, Safe Harvest Private Limited and Trustea – present three different types of innovations:

1. Innovation in program design: The key innovation in Andhra Pradesh Natural Farming is the program design that enables distributed innovation, where innovation in farming techniques takes place even outside the leadership of RySS and is distributed among the users of NF. In other words, the program is designed in such a way that farmers become experimenters and innovators to find solutions suitable to their context.

2. Innovation in product: The key innovation by Safe Harvest is the creation of a new product category – “pesticide-free” food – and establishment of the specialized supply chain required for it. Safe Harvest arose in response to farmers’ demands for market access and product differentiation. It targets that untapped middle-income consumer segment where there is already an awareness of and demand for “pesticide-free” foods for health and safety, and it ensures that there are no chemical pesticide residues or adulterants in its products via farmer training, rigorous testing of the consumer food products, etc.

3. Innovation in self-regulation: The key innovation at Trustea is the process of self-regulation by a sector. Trustea has developed a certification code specifically tailored for the Indian tea sector and consumers to meet their needs and demands for social and environmental sustainability. Directed by a multi-stakeholder council, it is driving the adoption of the Trustea code and supporting capacity building for the same among the tea producers and tea manufacturers.

Listed below are learnings, not only for India but also for other emerging economies, to enable high-impact agricultural innovation pathways:

4.1 The end-user needs to be placed at the center of innovation via end-user engagement and development of tailored, context-specific solutions

Recommendation

- Invest in ensuring that the organization and the innovation program is designed to engage end-users throughout the trajectory of innovation, wherein engagement can take various forms such as consultation, participation in decision making and co-creation of solutions.

Case studies show that an innovation program sustains itself when the innovation is kept relevant to the end-users through sustained engagement with them. Engagement can take various forms such as consultation, participation in decision making and co-creation of solutions. In the case of Andhra Pradesh Natural Farming, RySS recognized the end-users – the farmers – as innovators themselves. This inspired a program design where solutions are tailored by enterprising farmers themselves, according to their needs and contexts, in close cooperation with RySS. Top-down programs can ensure such bottom-up characteristics through constant push by the leadership, building bottom-up communication channels, training/sensitization of staff, and instituting a project design that enables

sustained community engagement. In all the cases, we note that engaging and understanding end-users and their context not only leads to the high uptake of the solution or intervention in question but also builds trust and credibility with the end-users which is essential for sustained impact.

4.2 Trust-building with key stakeholders is essential for long-term sustainability

Recommendations

- Invest in instruments that establish trust with all key stakeholders, such as communication, evidence generation and co-creation.
- Invest in understanding stakeholder motivation and behavior to keep these instruments of trust targeted.

Trust-building with key stakeholders is essential for long-term sustainability. Trust is a transcendental element that is central to the sustenance of all stakeholder relationships and thus the innovation program. It can emerge in the form of trust between partners, trust of the funders and trust of end-users. The following are the key instruments of trust-building that have been utilized in the three cases.

Alignment in long-term vision and co-creation. Trustea was able to work through a dynamic and diverse council because of its strong focus on establishing alignment within the stakeholders through multiple pre-engagement talks before formally collaborating with them. This alignment has been intrinsic in ensuring that there is trust among the council members, which led to effective decision making at Trustea.

Communication and active relationship building. In Andhra Pradesh Natural Farming, the vision of scaling up NF was shared by the initial philanthropic funders. This shared vision was a key driver of trust between RySS and the funders. Empowered by the Azim Premji Foundation's trust, RySS managed to employ funds in a flexible manner which further pushed innovation in NF at scale.

Relevant and targeted evidence generation. Evidence generation can take various forms, such as a successful pilot for generating trust with partners, testimonials from peer-farmers for creating trust with the community, and transparent availability of data on a key consumer concern for creating trust with consumers. For instance, Safe Harvest generates the right kind of evidence for its end-users (farmers and consumers) in the form of a "zero certification" mark for "pesticide-free" safe food and publicly available data on verification tests. In the case of Trustea, they have been able to increase the acceptability of the code among the stakeholders by engaging research and academic institutions to validate the Trustea code.

Trust-building is a complex process where the contexts and personalities of stakeholders play a key role in addition to the above-listed practical aspects. For example, in the case of Andhra Pradesh Natural Farming, it was a mix of a) the charismatic leadership of T. Vijay Kumar; b) the farmers' openness to alternative farming approaches; and c) RySS's treatment of farmers as the real innovators that significantly contributed to the heightened trust between RySS and the farmers.

4.3 Leadership drives the direction and success of the innovation

Recommendations

- Invest in recruiting/developing the leaders for the innovation programs.
- Avoid relying on innovation models that have succeeded while driven heavily by a uniquely able leadership, because they may have limited replicability or scalability in diverse contexts.

The leaders' characteristics play a significant role in influencing the direction of the innovation program. Many of these characteristics of the leaders are replicable, such as the capacity to champion a cause and inspire others, capitalize networks and think strategically. For instance, in the case of Safe Harvest, the championship of the CEO was one of the key drivers of successful innovation at scale. While these characteristics, individually, are replicable, their confluence in one individual is increasingly difficult. Therefore, if the success of an innovation program is driven heavily by a leader with a serendipitous confluence of these characteristics, that model of innovation will have limited replicability. Therefore, it potentially is going to be difficult to replicate all the success of the Andhra Pradesh Natural Farming program, which has benefited immensely by the leadership of T. Vijay Kumar – a mix of his charismatic style, his experience and credibility from building the National Rural Livelihood Mission, and his rich experience and network in Indian bureaucracy as a past bureaucrat in the Indian Administrative Service.

4.4 Leveraging formal and informal networks and organizations in the producer ecosystem can be an efficient as well as effective way to engage with a broader farmer base

Recommendations

- Public institutions should invest in enhancing formal and informal networks and organizations, such as SHG networks or FPO development, in farming communities to enable their multiplier effect.
- Include this multiplier effect while assessing the long-term benefits of such investments that focus on nurturing networks and organizations in the producer ecosystem.

In most cases, we observed that outreach to farmers, particularly smallholder farmers, became successful by leveraging the existing formal and informal social networks in the community, such as FPOs, SHGs and informal networks of local champion farmers. This allows for a multiplier effect in scaling farmer engagement, as was observed in the cases of Andhra Pradesh Natural Farming and Safe Harvest where the existing network of women's SHGs and the existing FPOs, respectively, were capitalized for scaling the farmer base of the program.

Leveraging such pre-existing networks can reduce transaction costs that would have otherwise been incurred trying to reach out to farmers individually. In order to identify such informal groups, ground presence of the initiators is essential, as seen in the case of Andhra Pradesh Natural Farming which achieves this through its network of CRPs. In case the initiators do not have a field presence, ground presence through field partners may also help in identifying such informal networks.

4.5 Government support can come via different channels, such as funding schemes, new regulations and endorsements

Recommendation

- Explore all channels to facilitate the government's support to innovation and invest in activating those channels.

Government support (at all levels) is valuable for scaling up innovations. Such support can come via different channels, such as partnerships with or endorsements of initiatives where long-term vision aligns, or government schemes that offer financial or technical support, regulations, etc.⁴⁰ In the case of Andhra Pradesh Natural Farming, the support from the state agriculture department is reinforced by bringing officers from the department on deputation to RySS, thus increasing the sense of ownership of the state officers toward the program. At the same time, the program is reaping the benefits of national and state schemes for programmatic funds and access to social networks of SHGs that were instituted by previous government development programs. In the case of Trustea, it is observed that the endorsement given by the Tea Board initially was valuable in building credibility and trust in Trustea's vision with various stakeholders.

4.6 A strategically crafted but continuously evolving bundle of interventions is essential for long-term success and scale

Recommendations

- Invest in the capacity of innovators to plan strategically and act responsively while keeping reasonable time horizons in perspective. This capacity includes:
 1. the ability to analyze, identify and prioritize the interventions and solutions that need to be bundled right from the beginning, for the success of the core intervention
 2. the ability to learn from the experience and sense material shifts happening inside or outside the organization so that changes required in the bundle can be identified in a timely manner
 3. the agility to tweak or transform the bundle when required and stay responsive to the new findings.
- Invest in identifying partners who can collaborate for identifying, designing and implementing interventions or solutions beyond the zone of influence of the innovator.

Bundling means implementing interventions in different areas simultaneously, such as market creation, business, policy, technology or value chain development. Some of these areas may be within the zone of influence of the initiator. For example, in the case of Trustea, the development and promotion of the domestic standards has been bundled with extensive capacity building of tea producers and awareness generation on sustainability. However, some areas of intervention are outside the zone of influence of the initiator. In these cases, relevant collaborations or partnerships

⁴⁰ This study could not delve deeper into strategies for activating these channels of government support. For further ideas on such strategies, see: https://ssir.org/articles/entry/making_the_government_adoption_of_social_innovations_work

can enable the required bundling. In the case of Andhra Pradesh Natural Farming, partnerships were made for generating scientific evidence for NF which was both a need of the program and, initially, outside the zone of influence of the program (as there was no internal scientific committee in the early days).

It is also observed that bundling happens both proactively and reactively. Proactive bundling is determined by the initiator's vision and horizon of planning. For example, in Safe Harvest, almost all of the partner civil society organizations have highly trained agricultural professionals who have enabled the development of rigorous internal systems that help farmers strictly adhere to NPM protocols as envisioned by Safe Harvest. Whereas reactive bundling is determined by the ability to respond to learnings and changing context. Andhra Pradesh Natural Farming exhibits a good example of responsive bundling. Initially, the program engaged with male farmer groups for promoting NF. Later, they realized that in districts where Andhra Pradesh Natural Farming had partnered with women's SHGs, the adoption of the program was 80-90% more than that in other districts. Learning this, RySS changed its strategy and started focusing on engagement with existing women's SHGs and creation of new ones as a core scale-up strategy.

4.7 Partnerships that are crafted based on the needs of the innovation program, managed rigorously and evolve with the changing context drive success

Recommendations

- Encourage synergistic partnerships in innovation investments.
- Invest in supporting instruments (innovation platforms, hubs, etc.) that catalyze partnership discovery.

Studies highlight the need to encourage interaction and coordination among actors from domains of research, development, business and governance along the entire agricultural value chain (AgriFutures 2016; FAO 2018). In addition to this, the case studies show that partnerships that meet the following criteria bring value to the innovation program:

Complementary expertise. For a successful partnership, partners must complement in terms of essential resources or expertise required for the success of the innovation program. For instance, in the case of Andhra Pradesh Natural Farming, RySS has developed partnerships with research institutions to enable evidence development and complement the overall program with necessary scientific rigor to sustain the program.

Alignment on goals. All stakeholders (partners and staff) must have a shared vision and be aligned on innovation goals. Safe Harvest shows that fundamental alignment on the long-term vision and core values with external partners (such as the financiers and suppliers) and internal staff imparted resilience through tough times. In the case of Trustea, it conducts a series of cautious pre-engagements before accepting a new member into the apex council to ensure that all the council members, who might have competing interests, are well aligned with Trustea's long-term vision and mission to drive sustainability in the Indian tea sector. This has enabled a greater trust among the council members.

Effective processes of partner engagement. Clear and effective processes of engagement enable the success and durability of partnerships. In the case of Trustea, it is observed that the apex council clearly outlined processes for decision making, voting, etc. by its members. This not only aided in developing transparency and trust among the partners but also made the communication, collaborative working, problem solving and decision making smoother and more efficient.

4.8 Innovations flourish when a mix of formal and informal actions come together

Recommendation

- Invest in creating space for informal action and interaction, such as networking platforms and innovation hubs.

Informal (or unplanned) actions often sow the seeds for formal trajectories of the innovation program. This is observed in the case of Andhra Pradesh Natural Farming where various NGOs had already developed the groundwork by testing and piloting alternative farming practices which then inspired the establishment of the Andhra Pradesh Natural Farming program. Similarly, the NPM movement had already organized networks of farmers which then inspired the incorporation of Safe Harvest. In the case of Trustea, a leading private sector organization invested in the preliminary development of a sector-wide standard and reached out informally to other players to set up a multi-stakeholder initiative. These efforts later culminated in the formalization of Trustea. This validates the need to create room for informal interactions and actions where experimental ideas can be validated.




Innovations flourish when a mix of formal and informal actions come together. Pictured: non-pesticide management members working with Safe Harvest (photo: Safe Harvest).

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Annex 1: Common analytical framework

1. Description of the case

- Construct a timeline of key events, such as innovation development, piloting, early scaling and ongoing growth.
- What type of innovation is it? Technology, policy/regulation, social institutions, financing, other services?
- The innovation was a solution to what problem?
- What are the key components of the innovation? Core innovation? Complementary innovations? Delivery model?
- What was the business or funding model? When and how did it become sustainable?
- How was the process of scaling funded?
- How was the innovation funded for users?
- How was the innovation developed and tested?
- Where was the innovation introduced and scaled? How did this evolve? Why evolution?
- Who were the users of the innovation (demographics)? How did this evolve? Why evolution?
- How did the context (where and who) affect the design and adaptation of the innovation? Scaling strategy?
- What was the scaling pathway and strategy? Public, private, civil society, PPP, some other combination?
- To the extent scaling was a partnership or collaboration, how was coordination managed?

2. Outcomes

- What changes, outcomes or impact did the innovation produce at scale? Did impact change over time? At scale?
- What evidence is there on outcomes at scale? Effects on different SAI objectives (environmental, social, human, productivity, profitability)?
- What were the costs and benefits?
- Who were the winners and losers of innovation?
- What happened to different groups?
- Any compensation or mitigation measures?
- Any spin-offs or unexpected benefits?
- As best you can, is the innovation sustainable for users? For any organization involved in the production, delivery, funding, etc. (if relevant)?

3. Actions and actors

- Who were the key players and their roles through time?
- What were the relevant characteristics of these players in terms of leadership, skills, competencies, resources or organizational culture?

- Who initiated and led the innovation process, and their motivation? The scaling process, and their motivation?
- What challenges or opportunities arose, and how was the innovation and/or scaling strategy adapted in response?
- How was the innovation process designed? Was this a deliberate strategy, make it up as you go along, or a mix?
- How was the scaling strategy designed and developed? Was this a deliberate strategy, make it up as you go along, or a mix?
- Were different phases of innovation and scaling led by different groups? Why? How did the handover take place?
- What partners were brought in, why, and how?
- What roles did they play (or contribute) in innovation and scaling?
- Why were they willing to play these roles? How were they persuaded?
- How were intended users involved in the innovation and scaling process? At what points? What mechanisms?
- Did demand exist in advance, or was it developed or created? If the latter, how was demand generated?
- Did the scaling process include other complementary systems changes such as policy, laws, regulations, strengthening parts of the value chain, market system or public sector organizations, e.g. capacity building?

4. Analysis

In your opinion, justified by evidence, what role did the following factors play in explaining the outcome at scale?

- The innovation processes.
- Innovation characteristics, including business/delivery/funding models.
- Relevance to demand, needs and priorities of users, other stakeholders.
- Characteristics of the users or places, e.g. infrastructure, education.
- Context, e.g. policy enabling environment, public sector organizations and capacity, value chain or market system actors.
- Choice of scaling pathway and strategy.
- Specific scaling activities, e.g. evidence generation, advocacy/marketing, community engagement, pricing, risk mitigation, use of champions.
- Characteristics of organizations/actors leading or driving the innovation and scaling process.
- Characteristics of partnerships and the organizations/actors that served as partners in the innovation and scaling process.

Annex 2: Case screening criteria

The master list of sourced case studies was screened using the following criteria.

A1.1 Screening criteria

- Sufficient availability of data (while avoiding over-documented cases) via documented literature or via the availability of informants who are willing to interview for the case study.
- Scale – Having reached a reasonable scale.
- Transformational change – whether it's an innovation that just impacted one element, stakeholder or dimension of the agricultural system in a significant manner or impacted multiple ones so that each of them had to co-evolve? What is the size of sustainable outcome achieved?
- Financial sustainability – preference to those innovations that have a sustainable financing model.
- Representing a variety of farms and farmers – the selection of cases should cover a variety of farmer sizes (smallholders, mid-sized farmers, large farmers) and locations of farmers (urban, peri-urban and rural).

A1.2 Case study diversification criteria

- Representing a variety of innovations – the selection of cases should cover a variety of innovations in policy, social institutions, business models, governance models, financial solutions as well as science and technology.
- Representing a variety of agricultural contexts and agricultural systems - India's agricultural sector is extremely diverse – multiple agricultural systems operating in a variety of agro-climatic zones and socio-economics settings. For a solution or innovation to work in an agricultural context as well as gain scale, it will potentially need to strike a balance between being adaptable (so that context-specific tailoring could be done) and relevant across multiple contexts. For lessons in this direction, ensuring this criterion is essential.
- Representing a variety of key actors – an innovation, during its journey from idea to scale, is driven by multiple anchor actors (civil society organizations, private companies, MSME clusters, government, etc.). We propose to select case studies such that the dynamics driven by different anchor actors can be understood.

Annex 3: Interviews

Andhra Pradesh Community Managed Natural Farming


1. Mr. Chandrasekhar Chakrala, Thematic Lead Farmers Institution, Rythu Sadhikara Samstha, August 24 and 31, 2021.
2. Ms. Divya Veluguri, Doctoral Student, University of Edinburgh, Global Academy of Agriculture and Food Systems, September 17, 2021 (reviewed case study).
3. Mr. Minaj Ameen, Director of Strategic Operations, Finance and Administration, Agroecology Fund, September 30, 2021.
4. Mr. G.M. Muralidhar, Senior Consultant, Rythu Sadhikara Samstha, August 12 and 16, 2021.
5. Mr. Hemasundar, Natural Farmer, August 26, 2021.
6. Ms. Laxmi, Self Help Group Leader, August 26, 2021.
7. Dr. Leigh Winowiecki, Scientist, World Agroforestry Centre, September 2, 2021.
8. Prof. Rajeshwar Singh Chandel, Executive Director, Prakritik Kheti Khushhal Kisan Yojna, Government of Himachal Pradesh, October 1, 2021.
9. Ms. Swati Renduchintala, Project Executive, Andhra Pradesh Natural Farming, July 30, August 12 and August 16, 2021.
10. Ms. Vanaja, Project Resource Person, Rythu Sadhikara Samstha, August 26, 2021.
11. Mr. Vankadoth Lakshmanaik, District Project Manager, Ananthapuramu, Andhra Pradesh Natural Farming, August 20 and September 5, 2021.

Safe Harvest Private Limited

1. Dr. Mihir Shah, Director, Safe Harvest Private Limited, August 18, 2021.
2. Mr. P.S. Vijayshankar, Director, Nature Positive Farming and Wholesome Foods Foundation, August 17, 2021.
3. Mr. Rangu Rao, CEO, Safe Harvest Private Limited, August 5, 13, 14, 18 and 19, 2021.
4. Mr. Srinivan Iyer, Ford Foundation, August 17, 2021.
5. Mr. T. Pradeep, Founder and Secretary, SAMUHA, August 17, 2021.
6. Mr. Ashish Kacholia, Director, Lucky Securities, October 1, 2021.
7. Mr. S.S. Bhat, CEO, Friends of Women's World Banking – India, October 1, 2021.
8. Mr. R.K. Anil, Chapter Author, Farming Futures, October 6, 2021.
9. Dr. Mahesh Chander, Head, Division of Extension Education ICAR – Indian Veterinary Research Institute, October 13, 2021.

Trustea

1. Dr. Anurag Priyadarshi, Director, Sustainability, Tata Consumer Products, August 18 and 23, 2021.
2. Mr. Bijoy Gopal Chakraborty, President, Confederation of Indian Small Tea Growers Association, August 20 and 26, 2021.
3. Mr. Daleram Gulia, Procurement Manager, Sustainability, Hindustan Unilever Limited, August 24, 2021.
4. Mr. Jagjeet Kandal, IDH – Sustainable Trade Initiative, August 19 and 25, 2021.

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5. Mr. Rajesh Bhuyan, Director, Trustea, August 4, 16, and 23, 2021.
 6. Mr. Sudip Ghosh, Sustainability, Indian Tea Association, August 26, 2021.
 7. Mr. Vikram Singh, Regional Manager – India, Ethical Tea Partnership, July 20, 2021.
 8. Dr. Madhuri Nanda, Director – South Asia, Rainforest Alliance. October 7, 2021.
 9. Dr. Natalie J Langford, Assistant Professor, Durham University, United Kingdom, October 1, 2021.



The Commission on Sustainable Agriculture Intensification (CoSAI) brings together 21 Commissioners to influence public and private support to innovation in order to rapidly scale up sustainable agricultural intensification (SAI) in the Global South.

For CoSAI, innovation means the development and uptake of new ways of doing things – in policy, social institutions and finance, as well as in science and technology.

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